



Australian Government

PMC552040 Operate glass melting process

Release: 1

PMC552040 Operate glass melting process

Modification History

Release 1. Supersedes and is equivalent to PMC552040C Operate glass melting process

Application

This unit of competency covers the skills and knowledge required to operate primary melting furnaces and ancillary equipment that is integral to the process. It applies to a large production context where the melting process is used to melt, refine or condition raw material to produce glass for forming processes or to form products directly from the melting furnace.

This unit of competency does not apply to secondary processes, the softening of already made glass or the production of scientific glass.

This unit of competency applies to operators who are required to start up and shut down the equipment, monitor and adjust process parameters, perform test procedures and identify and rectify routine problems.

This unit of competency applies to an individual working alone or as part of a team or group and working in liaison with other shift team members, team leader and supervisor, as appropriate.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite Unit

Nil

Competency Field

Operations

Unit Sector

Not applicable

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1 **Prepare the melting equipment**

1.1 Establish production program and melting guidelines from the job specifications/work instructions

1.2 Conduct furnace pre-start procedures according to

		enterprise procedure checklist
		1.3 Ensure furnace start-up function complies with standard operating procedures (SOPs)
		1.4 Ensure glass melting equipment is operated in accordance with established enterprise procedures
2	Test furnace back-up equipment	2.1 Make sure furnace back-up equipment test schedule is maintained
		2.2 Conduct back-up equipment test procedures to meet specific enterprise requirements
3	Melt raw materials	3.1 Interpret the molten glass mix and required furnace operation from job specifications
		3.2 Melt glass and monitor furnace and other operating parameters in accordance with established enterprise procedures
4	Monitor and interpret data and adjust operation	4.1 Monitor instruments and control panels, and interpret test results for fluctuations, variations and trends
		4.2 Monitor plant and process and deduce conditions of materials in process and products being made
		4.3 Determine appropriate action to improve process operation
		4.4 Adjust furnace controls to ensure glass melt parameters are maintained to job specifications
		4.5 Check that process operation has improved
		4.6 Continue analysing data and making adjustments until desired level of process operation is achieved and product is within specifications in accordance with work instructions
5	Rectify problems	5.1 Identify the range of faults that can occur during the operation

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| | 5.2 | Determine and rectify fault causes in accordance with established enterprise procedures |
| | 5.3 | Identify and rectify equipment failure causes in accordance with established enterprise procedures |
| | 5.4 | Make sure appropriate records and log books of equipment operations are maintained to meet enterprise requirements |
| | 5.5 | Identify non-routine problems and report to designated person |
| 6 | Control hazards | |
| | 6.1 | Identify hazards from the job to be done |
| | 6.2 | Identify other hazards in the work area |
| | 6.3 | Assess the risks arising from those hazards |
| | 6.4 | Implement measures to control those risks in line with procedures |

Foundation Skills

This section describes those required skills (language, literacy and numeracy) that are essential to performance.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Regulatory framework	The latest version of all legislation, regulations, industry codes of practice and Australian/international standards, or the version specified by the local regulatory authority, must be used.
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Applicable legislation, regulations, standards and codes of practice include:

- health, safety and environmental (HSE) legislation, regulations and codes of practice relevant to the workplace, equipment and production processes

- and hazardous materials
- Australian/international standards relevant to the materials being used and products being made
- any relevant licence and certification requirements.

All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state/territory or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and such requirements the legislative requirements take precedence.

Procedures All operations must be performed in accordance with relevant procedures.

Procedures are written, verbal, visual, computer-based or in some other form, and include one or any combination of:

- job cards
- emergency procedures
- work instructions
- SOPs
- safe work method statements (SWMS)
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant.

Tools and equipment

Tools and equipment include:

- furnaces
- measuring and recording equipment
- ancillary equipment that is integral to the process.

Problems Routine problems must be resolved by applying known solutions.

Routine problems are predictable and include one or more of:

- raw materials feed
- change of fuel source
- variations in furnace temperature
- variations in melt quality.

Known solutions are drawn from one or more of:

- procedures
- training
- remembered experience.

Non-routine problems must be reported according to according to relevant procedures.

Hazards Hazards must be identified and controlled. Identifying hazards requires consideration of:

- high temperatures
- smoke, dust, vapours or other atmospheric hazards
- weight, shape, volume of materials to be handled
- hazardous products and materials
- sharp edges, protrusions or obstructions
- slippery surfaces, spills or leaks
- electricity
- gas
- gases and liquids under pressure
- noise
- rotational equipment or vibration
- plant services (steam, condensate, cooling water, etc)
- structural hazards
- equipment failures
- machinery, equipment and product mass
- limited head spaces or overhangs
- working at heights
- working in restricted or confined spaces
- other hazards that might arise.

Records and reports Records include one or more of:

- log books/sheets
- electronic records
- job/work sheets
- other records used for the smooth running of the plant.

Reports include one or more of:

- paper or electronic-based logs and reports
- verbal/radio reports
- reporting items found which require action.

Unit Mapping Information

Release 1. Supersedes and is equivalent to PMC552040C Operate glass melting process

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=45a7f1d5-61a5-447a-9688-7abbd7e1a5c7>

Assessment Requirements for PMC552040 Operate glass melting process

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria and demonstrate the ability to:

- read and interpret, job sheets, procedures, instruments/control panels, test results, material labels and safety information
- perform pre-start procedures
- conduct back-up equipment test procedures to schedule
- analyse test results and control instrument data to identify fluctuations, variations and trends in process variables
- monitor key variables, including:
 - temperature
 - material flow and discharge rates
 - fuel source
 - melt quality
 - product integrity and general conformance to specification
- operate and adjust the equipment to meet product quality and production output specifications
- identify hazards and apply relevant hazard controls
- apply safety procedures
- apply housekeeping procedures
- recognise out-of-specification products, process problems and materials faults
- recognise routine and non-routine problems
- identify when the operator is able to rectify problems, when assistance is required and who is the appropriate source for assistance
- take action to resolve problems or report them to appropriate personnel
- distinguish between possible causes of routine problems, including:
 - raw material variations
 - equipment malfunctions
 - electrical/instrument malfunctions
 - process abnormalities
- communicate effectively with team/work group and supervisors
- complete workplace records
- do basic arithmetical manipulations, including additions, subtractions, divisions, fractions and percentages.

Knowledge Evidence

Must provide evidence that demonstrates knowledge relevant to their job sufficient to operate under routine only supervision and to solve routine problems, including knowledge of:

- principles of glass melting process
- control philosophy of process
- functions, limitations and principles of operation of melting equipment
- composition and nature of the glass
- critical material properties, settings and readings
- combustion fundamentals
- test procedures and schedule
- basic physics, and where appropriate chemistry, relevant to the equipment/process/materials
- the potential effects of variations in raw materials and equipment operation in relation to quality of product
- factors which may affect product quality or production output and appropriate remedies
- start-up and shutdown processes
- routine problems, their probable causes and relevant corrective actions
- organisation procedures relevant to the work environment/job role
- hierarchy of control
- hazards that may arise in the job/work environment and:
 - their possible causes
 - potential consequences
 - appropriate risk controls.

Assessment Conditions

- The unit should be assessed holistically and the judgement of competence shall be based on a holistic assessment of the evidence.
- The collection of performance evidence:
 - should occur over a range of situations which include typical disruptions to normal, smooth operation of an operating plant
 - will typically include a supervisor/third-party report or other evidence, focussing on consistent performance and problem recognition and solving. A supervisor/third-party report must be prepared by someone who has a direct, relevant, current relationship with the person being assessed and who is in a position to form a judgement on workplace performance relevant to the unit of competency
 - must include the use of an appropriate industrial item/s of equipment requiring demonstration of operation, start-up and shutdown procedures and responding to problems
 - may use industry-based simulation for all or part of the unit particularly where safety, lack of opportunity or significant cost is an issue.

- Assessment should occur in operational workplace situations. Where this is not possible or where personal safety or environmental damage are limiting factors assessment must occur in a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions. This must cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.
- Assessment in a simulated environment should use evidence collected from demonstration of skills and one or more of:
 - walk-throughs
 - pilot plant operation
 - industry-based case studies/scenarios
 - 'what ifs'.
- Knowledge evidence may be collected concurrently with performance evidence (provided a record is kept) or through an independent process such as workbooks, written assessments or interviews (provided a record is kept).
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.
- Conditions for assessment must include access to all tools, equipment, materials and documentation required, including relevant workplace procedures, product and manufacturing specifications associated with this unit.
- The regulatory framework will be reflected in workplace policies and procedures and is not required to be independently assessed.
- Foundation skills are integral to competent performance of the unit and should not be assessed separately.
- Assessors must satisfy the assessor competency requirements that are in place at the time of the assessment as set by the VET regulator.
- In addition the assessor or anyone acting in subject matter expert role in assessment shall demonstrate both technical competency and currency. If the assessor cannot demonstrate technical competency and currency they shall assess with a subject matter expert who does meet these requirements.
- Technical competence can be demonstrated through one or more of:
 - relevant VET or other qualification/Statement of Attainment
 - appropriate workplace experience undertaking the type of work being assessed under routine and non-routine conditions
 - appropriate workplace experience supervising/evaluating the type of work being assessed under routine and non-routine conditions
- Currency can be demonstrated through one or more of:
 - being currently employed undertaking the type of work being assessed
 - being employed by the organisation undertaking the type of work being assessed and having maintained currency in accordance with that organisation's policies and procedures
 - having consulted/had contact with an organisation undertaking the type of work being assessed within the last twelve months, the consultation/contact being related to assessment

- conducting on the job training/assessments of the type of work being assessed
- being an active member of a relevant professional body and participating in activities relevant to the assessment of this type of work.

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