



Australian Government

Department of Education, Employment and Workplace Relations

PMC552040C Operate glass melting process

Revision Number: 1

PMC552040C Operate glass melting process

Modification History

Not applicable.

Unit Descriptor

<p>Unit descriptor</p>	<p>This unit of competency covers the operation of primary melting furnaces. It involves preparing and operating glass melting equipment, monitoring process operations and making necessary adjustments, identifying and solving routine problems and undertaking minor maintenance on equipment.</p>
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Application of the Unit

<p>Application of the unit</p>	<p>This unit of competency applies to operators who are responsible for operating primary melting furnaces used in glass production or the forming of glass products directly from a melting furnace.</p> <p>This unit does NOT apply to the operation of furnaces used for reheating glass product, which is covered by <i>PMC552041C Operate process ovens</i>.</p> <p>This competency is typically performed by operators working either independently or as part of a work team. At all times they would be liaising with other members of the team.</p>
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

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 melting equipment	1.1. Establish production program and melting guidelines from the job specifications/work instructions 1.2. Conduct furnace pre-startup procedure according to enterprise procedure checklist 1.3. Ensure furnace startup function complies with standard operating procedures 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 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

ELEMENT	PERFORMANCE CRITERIA
	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

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include

- recognising process conditions which will lead to out of specification production and taking appropriate action
- implementing the enterprise's standard procedures and work instructions and relevant regulatory requirements within appropriate time constraints and in a manner relevant to the operation of the melting equipment
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- composition and nature of the glass
- startup and shutdown processes
- construction and limitations of the melting equipment and conditions
- combustion fundamentals
- out of specification situations
- physics and chemistry (where appropriate) of process
- principles of operation of process
- control philosophy of process
- distinguish between causes of faults such as:
 - raw material
 - mechanical
 - electrical/instrument

Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
<p>Overview of assessment</p>	<p>The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency.</p>
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>It is essential that the melting equipment be understood and that the importance of critical material properties, settings and readings is known.</p> <p>Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action.</p> <p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> • importance of critical material properties, settings and readings is identified • process and equipment are operated in accordance with work instructions and process parameters • temperatures are maintained within limits • melt quality is monitored to minimise wastage • start up and shut down occur first time • change in utilities (gas/power/diesel) is responded to immediately • signals and alarms are responded to immediately • process measurements and tests are continually made, observed and interpreted • melt quality is maintained to customer specifications. <p>Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.</p>
<p>Context of and specific resources for assessment</p>	<p>Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>Simulation or case studies/scenarios may be required to</p>

EVIDENCE GUIDE	
	allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual plant and will include 'walk-throughs' of the relevant competency components. A bank of scenarios/case studies/what ifs and questions will be required to probe the reasoning behind observable actions.
Method of assessment	<p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p> <p>It may be appropriate to assess this unit concurrently with:</p> <ul style="list-style-type: none"> • <i>MSAPMSUP292ASample and test materials and product.</i>
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.

Range Statement

RANGE STATEMENT	
<p>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.</p>	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Melting equipment	<p>This unit includes melting equipment applicable to each of the specific areas of glass products manufacture. These may include:</p> <ul style="list-style-type: none"> • flat glass • insulation, glass wool insulation, laminated blankets, roll and boards • fibreglass and glass filaments • packaging, bottles and jars
Tools and equipment	<p>Tools and equipment may include:</p> <ul style="list-style-type: none"> • furnaces and associated equipment • gas stations • computers • measuring and recording equipment • communication equipment • hand tools • safety clothing and equipment
Process and products	<p>Process and products include:</p> <ul style="list-style-type: none"> • melting, refining and conditioning of raw material, including frit and other recycled glass materials, to produce glass for forming processes <p>It does NOT include processes involved with:</p> <ul style="list-style-type: none"> • scientific glass • secondary processes • the softening of already made glass
Plant data	<p>Plant data includes:</p> <ul style="list-style-type: none"> • test results • instrument/control panel information

RANGE STATEMENT	
	<ul style="list-style-type: none"> • data from physical senses (sight, sound and hearing) • temperatures, pressures, material flow and discharge rates and effects • variations to chemical reactions/material modifications
Typical problems	Typical problems may include: <ul style="list-style-type: none"> • raw materials feed • alternative fuel sources • analysis of all plant data including test results, control instrument data and other observations • control of furnace temperature within specifications • surveillance of melt quality • taking corrective action
Occupational health and safety (OHS)	All operations are subject to stringent OHS requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OHS requirements, the OHS requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical
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Competency field

Competency field	
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Co-requisite units

Co-requisite units		