



Australian Government

Department of Education, Employment and Workplace Relations

PMC553041C Set up and optimise glass furnace process

Revision Number: 1

PMC553041C Set up and optimise glass furnace process

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers implementing furnace changeover and monitoring and optimising the forming of flat glass, including the rectification of equipment and quality problems.
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Application of the Unit

Application of the unit	<p>This unit of competency applies to experienced operators, leading hands or supervisors who are responsible for setting up and adjusting glass furnaces from the requirements as set out in production schedules and specifications. The operator is able to run trials and adjust all of the equipment settings to have the production equipment perform satisfactorily.</p> <p>This unit does NOT apply to the set up and optimisation of primary glass furnace processes, which is covered by <i>PMC553040C Set up and optimise glass forming process</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
<p>1. Remove current equipment and/or tooling</p>	<p>1.1. Identify all safety and emergency procedures</p> <p>1.2. Shut down furnace and ancillary equipment in accordance with work instructions and manufacturer's specifications</p> <p>1.3. Conduct tests and checks on equipment/tooling prior to removal in accordance with work instructions</p> <p>1.4. Remove current equipment/tooling in accordance with work instructions and manufacturer's specifications</p> <p>1.5. Complete records and logs for removal</p>
<p>2. Install and set up new equipment and/or tooling</p>	<p>2.1. Perform checks and tests prior to installation</p> <p>2.2. Identify any faults in equipment/tooling and take appropriate action</p> <p>2.3. Install and set up appropriate equipment/tooling for new production process in accordance with work instructions</p> <p>2.4. Ensure alignment of all equipment and perform checks according to product specifications and work instructions</p> <p>2.5. Ensure setup and configuration of equipment for startup complies with work instructions</p> <p>2.6. Perform checks and tests to product and equipment in accordance with work instructions</p>
<p>3. Monitor, interpret data and adjust operation</p>	<p>3.1. Ensure forming equipment start up function complies with work instructions</p> <p>3.2. Ensure glass forming equipment is operated in accordance with work instructions</p> <p>3.3. Monitor instruments and control panels, and interpret test results for fluctuations, variations and trends</p> <p>3.4. Monitor plant and process and deduce conditions of materials in process and products being made</p> <p>3.5. Determine appropriate action to improve process operation</p> <p>3.6. Adjust furnace controls to ensure glass parameters are maintained to job specifications</p> <p>3.7. Check that process operation has improved</p> <p>3.8. Continue analysing data and making adjustments until desired level of process operation is achieved and product is within specifications in accordance with work instructions</p>

ELEMENT	PERFORMANCE CRITERIA
4. Sample, test and record product data	4.1. Carry out sampling procedures appropriate to the product and the test in line with enterprise requirements 4.2. Complete appropriate test to enterprise and client requirements 4.3. Identify variations from process parameters and take appropriate action 4.4. Measure/graph and record operating parameters, according to enterprise requirements 4.5. Record test results in hard or electronic form as required by standard procedures and work instructions
5. Rectify equipment and quality problems	5.1. Identify the range of equipment and quality faults that can occur during the operation 5.2. Diagnose possible causes of equipment and quality faults 5.3. Rectify cause of equipment failure and quality faults by established enterprise procedures 5.4. Identify and rectify equipment failure causes in accordance with established enterprise procedures 5.5. Ensure appropriate records and log books of equipment operations are maintained to meet enterprise requirements 5.6. Identify non-routine problems and report to designated person
6. Shut down equipment	6.1. Shut down equipment in accordance with work instructions 6.2. Complete appropriate records and logs 6.3. Shut down equipment in an emergency situation
7. Prepare equipment for maintenance	7.1. Isolate equipment in accordance with work instructions 7.2. Ensure area is clear and safe for maintenance 7.3. Complete all records and logs
8. Control hazards	8.1. Identify hazards from the job to be done 8.2. Identify other hazards in the work area 8.3. Assess the risks arising from those hazards 8.4. 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
- implementing the enterprise's standard procedures and work instructions and relevant regulatory requirements in a manner relevant to the operation of the process
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- composition and nature of the glass
- setup/changeover of all equipment/tooling
- startup and shutdown processes
- optimisation of process for yield maximisation
- construction and limitations of the equipment
- out of specification situations
- quality problems such as:
 - poor optics
 - excessive breakage
 - non-uniform break pattern
 - incorrect cross bend
 - excessive bow
 - scratches
 - poor glass shape
- distinguish between causes of problems, such as:
 - raw material
 - mechanical
 - electrical/instrument

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

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.

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

It is essential that the equipment be understood and that the importance of critical material properties, settings and readings is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble than on recovery from a disaster.

Consistent performance should be demonstrated. In particular look to see that:

- setup/tuning are completed to specifications
- temperature and pressures are maintained within limits
- quality is monitored to minimise wastage
- startup and shutdown occur first time
- early warning signs of equipment/processes needing attention or potential problems are recognised and dealt with in a timely manner
- process measurements are continually made or observed
- the range of possible causes can be identified and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems to related plant areas are recognised and an appropriate contribution made to their solution.

Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.

Context of and specific resources for assessment

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

EVIDENCE GUIDE	
	<p>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 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.</p>
Method of assessment	<p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.</p>

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.

Procedures

All operations are performed in accordance with standard procedures and work instructions

Application of equipment

This unit includes equipment applicable to formed glass manufacture, such as:

- equipment/tooling which may include:
 - mould
 - lift jet array
 - quench ring
 - press ring
 - tile
- other production equipment:
 - forming and conditioning equipment
 - computers
 - measuring recording equipment
 - communication equipment
 - hand tools

Types of changeovers

Types of changeovers may include:

- deep bend to deep bend or deep bend to quick sag
- quick sag to quick sag
- advanced press bend to advanced or conventional press bend
- conventional press bend to conventional press bend

It does NOT include processes involved with:

- melting furnaces used in glass production (primary source)
- scientific glass

Typical problems

Typical problems may include:

- temperature and pressure problems

RANGE STATEMENT	
	<ul style="list-style-type: none"> • equipment problems • quality problems
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		