

<b>Title</b>	<b>Manufacture toughened and heat strengthened glass</b>		
<b>Level</b>	<b>4</b>	<b>Credits</b>	<b>10</b>

<b>Purpose</b>	<p>This unit standard is for experienced people in the glass processing industry working with specialist glass.</p> <p>People credited with this unit standard are able to: prepare to manufacture toughened and heat strengthened glass; and use horizontal glass tempering machines to manufacture toughened and heat strengthened glass.</p>
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<b>Classification</b>	Glass and Glazing > Glass Processing and Manufacturing
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<b>Available grade</b>	Achieved
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### Guidance Information

- 1 Legislation and standards relevant to this unit standard include:  
[Health and Safety at Work Act 2015](#);  
[Resource Management Act 1991](#);  
AS/NZS 2208:1996, *Safety glazing materials in buildings*;  
AS/NZS 2080:2006, *Safety glazing for land vehicles*, available at  
<http://www.standards.co.nz>.

Any new, amended or replacement Acts, regulations, standards, codes of practice, guidelines, or authority requirements or conditions affecting this unit standard will take precedence for assessment purposes.

- 2 Definitions  
*Job specifications* refer to the scope of the work being undertaken. It includes the objectives, quality requirements, deliverables, timeline, budget, etc.  
*Recipe* refers to machine settings used by equipment on a production line to process material and produce product or sub-assemblies in a consistent manner.  
*Workplace procedures* refer to the documented procedures specific to a workplace that set out the standard and the required practices of that workplace. This may include job specifications, procedures, practices, manufacturer recommendations, technical data sheets and material safety data sheets.
- 3 Assessment  
Evidence for this unit standard must reflect:
  - industry standards, current health, safety, industry, and workplace procedures;
  - job specifications and customer requirements;
  - industry requirements for commercially acceptable timeframes.

**4 Range**

Types of glass which can be manufactured by the processes covered in this unit standard are limited to – float glass from 4 mm to 19 mm in thickness, obscure glass with shallow patterns.

**5 Recommended skills and knowledge**

Unit 26035, *Demonstrate knowledge of processing toughened and heat strengthened glass in a horizontal glass tempering machine* or demonstrate equivalent knowledge and skills.

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**Outcomes and performance criteria****Outcome 1**

Prepare to manufacture toughened and heat-strengthened glass.

**Performance criteria**

1.1 Preparation of work area and personal safety precautions are carried out.

Range preparation includes but is not limited to – selection and use of protective clothing and safety equipment, identification of hazards and risks, checks of emergency stops and battery drives on machine, review of operational procedures, clearing work area and ensuring equipment is maintained and safe to operate.

1.2 Glass to be manufactured is checked.

Range checks include but are not limited to – glass and processing system to be used match the requirements of work or customer order, completion of relevant standard tests, glass size is within processing equipment limitations, glass manufacturer's size and processing limitations, printing face, shapes and patterns for printing table placement.

1.3 Glass is prepared for manufacturing.

Range preparation includes but is not limited to – marking glass with standards identification in accordance with work or customer order, selecting and positioning glass on the loading table, and inputting machine settings/recipe and cooking times for the type of glass being toughened.

1.4 Glass testing requirements as per AS/NZS 2208:1996 are confirmed to ensure the product meets customer and standards requirements.

**Outcome 2**

Use horizontal glass tempering machines to manufacture toughened and heat strengthened glass.

**Performance criteria**

- 2.1 Pre-start, start, and set-up procedures are carried out.
- 2.2 Glass is loaded into the furnace bed.
- Range loading includes but is not limited to – placement orientation, placement pattern, compliance marking.
- 2.3 Glass is forwarded into the furnace.
- 2.4 Settings or recipe and cooking time is selected.
- 2.5 Furnace operation is monitored, and adjustments are made.
- 2.6 Emergency procedures are applied if glass breakage occurs in the furnace.
- 2.7 Manufactured glass is checked for quality, and standard tests are completed and recorded.
- Range standard tests include but are not limited to – bow test, thickness, and fragmentation test.
- 2.8 Glass is labelled and unloaded from the unloading table.
- 2.9 Post-processing clean-up is completed.

<b>Planned review date</b>	31 December 2029
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**Status information and last date for assessment for superseded versions**

Process	Version	Date	Last Date for Assessment
Registration	1	27 April 2004	31 December 2013
Review	2	21 May 2010	31 December 2017
Review	3	18 June 2015	31 December 2026
Rollover and Revision	4	25 August 2022	31 December 2026
Review	5	24 October 2024	N/A

<b>Consent and Moderation Requirements (CMR) reference</b>	0073
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

**Comments on this unit standard**

Please contact Hanga-Aro-Rau Manufacturing, Engineering and Logistics Workforce Development Council at [qualifications@hangaarorau.nz](mailto:qualifications@hangaarorau.nz) if you wish to suggest changes to the content of this unit standard.