Title	**Demonstrate knowledge of manufacturing laminated safety glass**		
Level	**4**	**Credits**	**5**

Purpose	This theory-based unit standard is for experienced people in the glass processing industry working with specialist glass. People credited with this unit standard are able to demonstrate knowledge of: the manufacturing processes for laminated safety glass (LSG); preparing to manufacture LSG, and manufacturing LSG.

Classification	Glass and Glazing > Glass Processing and Manufacturing

Available grade	Achieved

Guidance Information

1 Legislation, guidelines, and standards relevant to this unit standard include:
Health and Safety at Work Act 2015;
Safe Use of Machinery: Best Practice Guidelines; available at www.worksafe.govt.nz;
AS/NZS 2208:1996, *Safety glazing materials in buildings*;
NZS 4223.2:2016, *Glazing in buildings - Part 2: Insulating glass units*; 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.
LSG refers to laminated safety glass, which is a type of safety glass consisting of two or more layers of glass with one or more thin polymer interlayers between them, which prevent the glass from breaking into large sharp pieces.
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.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of the manufacturing processes for LSG.

Performance criteria

1.1 Requirements for preparing the work area and personal safety precautions are identified and described.

Range requirements include – selection and use of protective clothing and safety equipment, identification of hazards and risks, storage and handling of dangerous goods, checking of interlayer shelf life, selecting equipment, completing equipment check and maintenance procedures, clearing work area, check of ultra-violet lamp life.

1.2 Process for manufacturing LSG is described in accordance with equipment manufacturer's recommendations.

Range process may include – clean room procedures, clean room hoist operation, vacuum bags, pre-press oven and glass stacker operation, air lifter operation, loading and unloading of ovens; evidence of two is required.

Outcome 2

Demonstrate knowledge of preparing to manufacture LSG.

Performance criteria

2.1 Types of materials used in manufacturing LSG are identified and described.

Range materials include but are not limited to – glass type, interlayer materials, cleaning agents, coatings, adhesives and sealants.

2.2 Process of preparing glass for manufacturing is described.

Range process includes – washing glass using a washing machine, checking glass quality to ensure no scratches or watermarks are left after washing, laying up of glass and interlayers, and vacuum bags, to meet work or customer order requirements.

Outcome 3

Demonstrate knowledge of manufacturing LSG.

Performance criteria

3.1 Processes used for checking and verifying glass to be manufactured are described.

Range checks include – 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.

3.2 Types of faults that can occur in laminate are identified and described in terms of their impact on the finished product.

Range faults include – bubbles, cracks, chipping on edges, interlayer not removed, haze on the glass surface.

3.3 Process for curing laminate is described.

3.4 Process for inspecting and marking approved laminates is described in terms of the requirements of NZS 2208 1996.

3.5 Documentation requirements are identified and described.

Planned review date	31 December 2029

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	18 June 2015	31 December 2026
Rollover and Revision	2	25 August 2022	31 December 2026
Review	3	24 October 2024	N/A

Consent and Moderation Requirements (CMR) reference	0073

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 if you wish to suggest changes to the content of this unit standard.