

**Modification history**

Release	Comments
Release 1	This version released with FWP Forest and Wood Products Training Package Version 8.0.

<b>FWPTMM3XXX</b>	<b>Develop knowledge of glue laminated timber or cross laminated timber production</b>
<b>Application</b>	<p>This unit of competency describes the skills and knowledge required to recognise the products and processes involved in the production of glue laminated timber (GLT) or cross laminated timber (CLT), including the characteristics of timber used in GLT or CLT, the stages in GLT or CLT production, glue and gluing systems used in GLT or CLT production, and quality control in GLT or CLT production.</p> <p>The unit applies to operational staff who are engaged in a range of work roles in GLT or CLT production.</p> <p>No licensing, legislative or certification requirements apply to this unit at the time of publication.</p>
<b>Prerequisite Unit</b>	Nil
<b>Unit Sector</b>	Timber Manufactured Products (TMM)

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Recognise properties and uses of GLT or CLT	1.1 Identify properties of GLT or CLT 1.3 Identify different applications of GLT or CLT in building and construction 1.4 Assess advantages and disadvantages of using GLT or CLT as a building and construction material
2. Research GLT or CLT production process	2.1 Identify workflow in GLT or CLT production process 2.2 Identify processes involved in the lamella production stage 2.3 Recognise processes involved in forming or laying board layers stage 2.4 Identify equipment and processes used in the pressing stage 2.5 Recognise the steps in the final processing stage, including calibrating and lengthwise or all sides cutting of laminated product 2.6 Assess factors that may impact on workflow in GLT or CLT production process 2.7 Assess safety and environmental hazards associated with GLT or CLT production process
3. Recognise glues and gluing systems used in GLT or CLT production	3.1 Identify types, properties and hazards associated with glues used in GLT or CLT production 3.2 Identify types and applications of gluing systems used in GLT or CLT production 3.3 Identify glue curing methods in GLT or CLT production
4. Assess testing and quality control procedures in GLT or CLT production	4.1 Identify factors that influence joint and bond quality in CLT or GLT production 4.2 Identify quality control check points in GLT or CLT production process 4.3 Recognise types and causes of delamination and non-delamination defects in GLT or CLT production 4.4 Assess purpose and application of bond strength and durability tests in GLT or CLT production 4.5 Identify testing procedures and how test data is interpreted and used to determine appropriate follow up actions

<b>Foundation Skills</b>	
<i>This section describes those language, literacy, numeracy and employment skills that are essential for performance in this unit of competency but are not explicit in the performance criteria.</i>	
<b>Skill</b>	<b>Description</b>
Reading	<ul style="list-style-type: none"> <li>Read material safety sheets on glues used in GLT or CLT production</li> </ul>

<b>Unit Mapping Information</b>			
<b>Code and title current version</b>	<b>Code and title previous version</b>	<b>Comments</b>	<b>Equivalence status</b>
FWPMOP3XXX Develop knowledge of glue laminated timber or cross laminated timber production	Not applicable	The unit has been created to address a skill or task required by industry that is not covered by an existing unit.	New unit

<b>Links</b>	
	Companion Volumes, including Implementation Guides, are available at VETNet: <a href="https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=0d96fe23-5747-4c01-9d6f-3509ff8d3d47">https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=0d96fe23-5747-4c01-9d6f-3509ff8d3d47</a>

<b>TITLE</b>	<b>Assessment requirements for FWPMOP3XXX Develop knowledge of glue laminated timber or cross laminated timber production</b>
<b>Performance Evidence</b>	
<p>An individual demonstrating competency must satisfy all of the elements and performance criteria in this unit.</p> <p>There must be evidence that the individual has researched either glue laminated timber (GLT) or cross laminated timber (CLT) production and identified:</p> <ul style="list-style-type: none"> <li>• two examples of CLT or GLT product appearance and structural grades for building and construction applications</li> <li>• two examples of CLT or GLT product applications in the building and construction industry</li> <li>• two advantages and two disadvantages of CLT or GLT building and construction material</li> <li>• production workflow for either CLT or GLT and two factors that may affect workflow performance</li> <li>• one type of gluing system used in either GLT or CLT production</li> <li>• properties and one potential hazard of two glue products used in either GLT or CLT production</li> <li>• three timber characteristics required in the lamination process in CLT or GLT production to ensure joint and bond quality</li> <li>• three examples of quality control check points in CLT or GLT production</li> <li>• three factors that may affect lamination quality in CLT or GLT production.</li> </ul>	
<b>Knowledge Evidence</b>	
<p>An individual must be able to demonstrate the knowledge required to perform the tasks outlined in the elements and performance criteria of this unit. This includes knowledge of:</p> <ul style="list-style-type: none"> <li>• properties of CLT or GLT: <ul style="list-style-type: none"> <li>• appearance grades</li> <li>• structural grades</li> </ul> </li> <li>• advantages of using CLT or GLT in building and construction: <ul style="list-style-type: none"> <li>• fire and seismic performance</li> <li>• insulation</li> <li>• strength to weight ratio</li> <li>• dimensional stability</li> <li>• sustainable material</li> <li>• prefabrication</li> <li>• durability</li> <li>• carbon reduction</li> </ul> </li> <li>• disadvantages of using CLT or GLT in building and construction: <ul style="list-style-type: none"> <li>• cost</li> <li>• resistance to humidity</li> <li>• airtightness</li> </ul> </li> <li>• applications of GLT or GLT in building and construction: <ul style="list-style-type: none"> <li>• GLT - beams, column, roof trusses, or</li> <li>• CLT - floors, walls, roofs, stairs</li> </ul> </li> <li>• characteristics of timber used in GLT or CLT production: <ul style="list-style-type: none"> <li>• moisture content</li> <li>• visual appearance</li> <li>• structural properties</li> </ul> </li> <li>• stages involved in GLT or CLT production: <ul style="list-style-type: none"> <li>• lamella production stage - pre-planing, timber grading, optimising - removal of defects, finger jointing lamellas, planing and cross cutting</li> <li>• forming of layers and glue application stage</li> <li>• pressing stage</li> <li>• final processing stage - calibrating and cutting either lengthwise or framing</li> </ul> </li> <li>• factors impacting on workflow in GLT or CLT production: <ul style="list-style-type: none"> <li>• availability of timber</li> <li>• operational, supervisory and management skills</li> <li>• access to and maintenance of GLT or CLT plant and equipment</li> </ul> </li> </ul>	

<b>Knowledge Evidence</b> <ul style="list-style-type: none"> <li>types, properties and hazards of glues used in GLT or CLT production:             <ul style="list-style-type: none"> <li>polyurethane adhesives</li> <li>phenol resorcinol formaldehyde adhesive</li> </ul> </li> <li>types and applications of gluing systems</li> <li>quality control check points in GLT or CLT production process</li> <li>defects in GLT or CLT products:             <ul style="list-style-type: none"> <li>delamination defects</li> <li>non-delamination defects - stepping, incorrect finger-joint placements, incorrect lay-up</li> </ul> </li> <li>factors that may affect lamination quality of GLT or CLT products:             <ul style="list-style-type: none"> <li>moisture content</li> <li>timber grade</li> <li>straight and square edges and faces</li> <li>consistent thickness</li> <li>surface finish</li> <li>glues and adhesives</li> <li>curing temperature</li> <li>pressing time</li> <li>post-cure time</li> </ul> </li> <li>bond strength and durability tests used in GLT or CLT production process, including how to read test data and use results</li> <li>safety and environmental hazards associated with GLT or CLT production.</li> </ul>	
<b>Assessment Conditions</b> <p>Assessment of the skills in this unit of competency must take place under the following conditions:</p> <ul style="list-style-type: none"> <li>physical conditions:             <ul style="list-style-type: none"> <li>skills must be demonstrated in a work environment or an environment that accurately represents workplace conditions</li> </ul> </li> <li>resources, equipment and materials:             <ul style="list-style-type: none"> <li>reference materials on CLT or GLT, CLT or GLT production processes and glue and gluing systems used in CLT and GLT production processes</li> <li>Internet access and computer software and hardware for accessing technical information on CLT or GLT production</li> </ul> </li> <li>specifications:             <ul style="list-style-type: none"> <li>sections of National Construction Code relevant to GLT or CLT applications in building and construction.</li> </ul> </li> </ul> <p>Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.</p>	
<b>Links</b>	Companion Volume implementation guides are found in VETNet: <a href="https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=0d96fe23-5747-4c01-9d6f-3509ff8d3d47">https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=0d96fe23-5747-4c01-9d6f-3509ff8d3d47</a>