

Title	Apply 3D CAD/CAM in boatbuilding		
Level	5	Credits	5

Purpose	People credited with this unit standard are able to: produce and export 3D CAD boat drawings; import 3D CAD boat drawings and produce boat components using a multi axis CNC machine; and check machined boat components.
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Classification	Boating Industries > Boatbuilding
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Available grade	Achieved
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Guidance Information

1 Definitions

Apply in this unit standard refers to producing boat drawings using 3D CAD/CAM software.

CAD – Computer Aided Design using computer drawing software.

CAM – Computer Aided Manufacture software and machines that enable the CAD drawing to be converted to G-code format and cut components.

CNC – Computer Numerical Control. Refers specifically to a computer machine controller that reads G-code instructions (usually derived from CAD software) that drives the machine tool.

3D – three dimensional with an x, y and z axis.

Job specifications refer to the standard requirements of the job being undertaken.

Multi axis refers to CNC machine head that can move in more directions than x, y, and z to enable efficient milling of compound curved surfaces.

Workplace policies and procedures refer to the documented procedures and policies providing guidelines of the tasks and activities carried out in the workplace. This typically includes relevant health and safety requirements to manage risk in the workplace.

2 This unit standard only covers 3D CAD drawing and CNC/CAM machining – not 2D. For 2D CAD drawing refer to Unit 25152, *Apply 2D CAD/CAM in boatbuilding*.

3 Suitable materials for cutting include – timber, plywood, medium density fibreboard (MDF), metal, plastics.

4 For the purposes of this unit standard the product drawn in outcome 1 is the same product to be exported and cut.

5 Competence in all outcomes must be demonstrated for two drawings and components.

Outcomes and performance criteria

Outcome 1

Produce and export 3D CAD boat drawings.

Performance criteria

1.1 3D CAD boat drawings are produced in accordance with job specifications.

Range may include but is not limited to – bevelled frames, foils, bulbs, keels, superstructure, hulls.

1.2 3D CAD boat drawing files are exported to CNC machine or server in accordance with company procedures.

Range may include but is not limited to – transfer by network, flash drive, other data transfer media.

Outcome 2

Import 3D CAD boat drawings and produce boat components using a multi axis CNC machine.

Performance criteria

2.1 3D CAD drawing is imported into CNC/CAM software in accordance with software requirements.

2.2 Tool and clearance corrections are assigned in accordance with machine and job specifications.

2.3 Machining settings are test run in the software in accordance with workplace practice.

2.4 Multi axis CNC machine is run in order to produce boat components.

Outcome 3

Check machined boat components.

Performance criteria

3.1 Machined components are checked for accuracy in accordance with the 3D CAD drawings.

Planned review date	31 December 2027
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	21 May 2010	31 December 2022
Rollover and Revision	2	30 August 2018	31 December 2022
Review	3	27 August 2020	31 December 2022
Review	4	27 October 2022	N/A

Consent and Moderation Requirements (CMR) reference	0136
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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 if you wish to suggest changes to the content of this unit standard.