

Title	Produce detailed two-dimensional engineering drawings using CAD software under supervision		
Level	3	Credits	6

Purpose	People credited with this unit standard are, under supervision, able to: determine drawing requirements; determine tolerances and dimensions to produce drawings; produce and confirm two-dimensional (2D) engineering drawings using CAD software and follow drawing office procedures.
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Classification	Mechanical Engineering > Engineering Drawing and Design
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Available grade	Achieved
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Entry information

Recommended skills and knowledge	Unit 2433, <i>Produce engineering component drawings using CAD software</i> , or demonstrate equivalent skills and knowledge.
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Explanatory notes

- 1 Reference
SAA/SNZ HB1:1995 Joint handbook – *Technical drawing for students*. Available from Standards New Zealand.
- 2 Definitions
CAD – computer aided design.
DXF – drawing exchange format.
DWG - the standard file format for saving AutoCAD-based vector graphics.
IGES – initial graphics exchange specification.
STEP – standard for the exchange of product data.
Accepted industry practice refers to approved codes of practice and standardised procedures accepted by the wider mechanical engineering industry sectors as examples of best practice.
Assembly refers to two or more manufactured parts assembled into a complete machine, structure, or unit of a machine
Component refers to individual parts of an assembly in the unfixed state.
Interpretation refers to the explanation in practical terms of features shown graphically in the drawing.
Job specifications refers to instructions relevant to the safe completion of the specific task, such as technical specifications, assembly instructions, drawings, parts lists, standards, codes of practice, test and commissioning procedures, and verbal instructions.

Supervision refers to working under the direction of a suitably qualified tradesman or manager who oversees the learner and is responsible for ensuring that the quality of work meets the required standard.

Two dimensional (2D) CAD software refers to software developed to draw and manipulate objects that have two dimensions (such as width and height) and no thickness.

Workplace procedures refers to procedures used by the organisation carrying out the work and applicable to the tasks being carried out. They may include but are not limited to – standard operating procedures, safety procedures, equipment operating procedures, codes of practice, quality management practices and standards, procedures to comply with legislative and local body requirements.

3 Assessment information

This unit standard covers the production of working drawings of assemblies and components used within the engineering industry. Examples may include but are not limited to – simple pump, gearbox, hydraulic cylinder, support frame, tool and die, holding device, sheet metal fabrication.

Assessment against this unit standard requires the presentation of a range of 2D engineering drawings using proprietary CAD software.

Assessment across all outcomes requires the production of five drawings of individual components, and one assembly drawing containing a minimum of five components. All hard-copy drawings must be presented on separate pages, and must include reference data.

Outcomes and evidence requirements

Outcome 1

Determine drawing requirements under supervision.

Evidence requirements

- 1.1 Components and assemblies to be drawn are identified and interpreted from instructions, sketches, finished products or job specifications in accordance with workplace procedures or accepted industry practice.
- 1.2 Drawing end-use requirements are identified, verified, and recorded in accordance with workplace procedures or accepted industry practice.
- Range examples of end-use requirements – print requirements, drawing size.
- 1.3 Required drawing notes are identified to meet construction requirements.
- Range examples of drawing notes – welding, assembly, or finishing procedures.
- 1.4 Drawing parameters are selected to meet practical drawing interpretation requirements.
- Range projection, view, scale, layout.

Outcome 2

Determine tolerances and dimensions for drawings to meet job specifications under supervision.

Evidence requirements

- 2.1 CAD tolerances are determined and set according to component drawing requirements.
- 2.2 Dimensions are set to meet component drawing requirements.

Outcome 3

Produce detailed two-dimensional engineering drawings using CAD software under supervision.

Evidence requirements

- 3.1 Components and assemblies are drawn to meet component construction requirements.
- 3.2 Drawings are dimensioned and labelled to meet component construction requirements.
- 3.3 Drawing files are saved in different formats in accordance with workplace procedures.

Range examples of formats– IGES, DXF, DWG.

- 3.4 Supplementary data is extracted from drawing to determine component properties.

Range supplementary data includes but is not limited to – areas, lengths, angles, perimeters.

Outcome 4

Confirm detailed two-dimensional engineering drawings under supervision.

Evidence requirements

- 4.1 Drawings are checked to ensure compliance manufacturing and functional requirements in accordance job specifications.
- 4.2 Any non-conformance to job specifications is corrected in accordance with workplace procedures or accepted industry practice.

Outcome 5

Follow drawing office procedures under supervision.

Evidence requirements

5.1 Drawing office procedures are followed in accordance with workplace procedures or accepted industry practice.

Range examples of drawing office procedures – accessing, revising, recording, filing, copying, issuing of drawings, back-ups.

Replacement information	This unit standard replaced unit standard 2435.
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Planned review date	31 December 2021
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	26 July 2004	31 December 2011
Rollover and Revision	2	20 March 2009	31 December 2016
Review	3	17 November 2011	31 December 2021
Review	4	15 September 2016	N/A

Consent and Moderation Requirements (CMR) reference	0013
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

Please note

Providers must be granted consent to assess against standards (accredited) by NZQA, before they can report credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be granted consent to assess against standards by NZQA before they can register credits from assessment against unit standards.

Providers and Industry Training Organisations, which have been granted consent and which are assessing against unit standards must engage with the moderation system that applies to those standards.

Requirements for consent to assess and an outline of the moderation system that applies to this standard are outlined in the Consent and Moderation Requirements (CMR). The CMR also includes useful information about special requirements for organisations wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.

Comments on this unit standard

Please contact Competenz qualifications@competenz.org.nz if you wish to suggest changes to the content of this unit standard.