National Certificate in Engineering - Fabrication (Level 4) with strands in Heavy Fabrication, Light Fabrication, and Steel Construction

Level **4**

Credits **252-268**

This qualification has been reviewed. The last date to meet the requirements is 31 December 2022.

Transition Arrangements

This qualification was republished in October 2017 to extend the last date for enrolment from 31 December 2017 to 31 December 2018, and the last date of assessment from 31 December 2021 to 31 December 2022.

This qualification has been replaced by New Zealand Certificate in Engineering Fabrication (Trade) (Level 4) with strands in Heavy Fabrication, Light Fabrication, and Steel Construction [Ref: 2719].

The last date for entry into programmes leading to this qualification is 31 December 2018. The last date for assessments to take place for this qualification is 31 December 2022, when the qualification will be discontinued.

People currently working towards this qualification may either complete the requirements by 31 December 2022, or transfer their results to the replacement qualification.

This qualification contains expiring unit standards for which replacement unit standards have now been registered. For the purposes of this qualification, those people who have gained credit for the replacement standards are exempt from the requirement to gain credit for the expiring standards.

Credit for	Exempt from
26551, 26552	6401, 6402
29479, 29480	15845
29549	20917
29550	20799
29653	2432
29655	2430
29670, 29730	25075
29674	21909

For detailed information see Review Summaries on the NZQA website.

NZQF Registration Information

Process	Version	Date	Last Date for Assessment
Registration	1	December 1995	May 2001
Revision	2	January 1997	June 2007

Process	Version	Date	Last Date for Assessment
Review	3	May 2001	December 2014
Revision	4	January 2004	December 2014
Review	5	September 2009	December 2022
Review	6	July 2015	December 2022
Republication	6	May 2016	December 2022
Republication	6	October 2017	December 2022

Standard Setting Body

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National Certificate in Engineering - Fabrication (Level 4) with strands in Heavy Fabrication, Light Fabrication, and Steel Construction

Level **4**

Credits **252 or 268**

Purpose

The National Certificate in Engineering - Fabrication (Level 4) with strands in Heavy Fabrication, Light Fabrication, and Steel Construction is a trade qualification for people in the fabrication industries. It combines a broad, common foundation of engineering and fabrication skills with more specialised skills and knowledge in the form of strands to suit the nature of the particular trade or enterprise the individual is engaged in. It is intended to provide training for people in trades traditionally referred to as fabricators, sheet metal workers, boiler makers, steel construction, and fitter-welders.

The core compulsory section includes standards on first aid, occupational health and safety, measurement, tools, materials and metals, engineering sketching and drawing, trade calculations, welding processes, fitting, assembly, scaffolding, basic fabrication operations, forces and stresses, pressure vessels, pattern development, computer numerical control, and job costing.

The core elective section includes standards from the Welding and Metal Surface Finishing domains at levels 3 and 4.

The strands cover trade practice and practical assessments relevant to each strand.

The Heavy Fabrication strand is intended for fabricators working with heavier gauge plate, sections, and pipes, to produce a wide variety of products including pressure vessels.

The Light Fabrication strand is for fabricators working with sheet metals and lighter gauge plate, sections, and pipes to produce a large variety of metal products.

The Steel Construction strand shares standards in common with the Heavy Fabrication strand, but is specifically for fabricators who manufacture and install structural steel components for building and civil engineering projects.

Those who have achieved this qualification may wish to continue training for the following higher qualifications:

- National Certificate in Engineering - Fabrication (Level 5) with strands in Heavy Fabrication, Light Fabrication, and Welding [Ref: 0681].
- National Diploma in Engineering (Level 6) with strands in Mechanical Engineering, Production Engineering, and Mechanical Services, and with an optional strand in Practical Endorsement [Ref: 0534].

Special Notes

This qualification incorporates the standards of the National Certificate in Mechanical Engineering (Level 2*)* [Ref: 1220]. People who have achieved that qualification with Unit 25075, *Perform basic fabrication operations under supervision*, will already have 62 credits towards this qualification. People who have achieved that qualification with Unit 21906, *Perform basic mechanical engineering machining operations under supervision*, will already have 50 credits towards this qualification.

Credit Range

	Core Compulsory	Core Elective A	Core Elective B
Level 1 credits	6	-	-
Level 2 credits	72	-	-
Level 3 credits	36	12	0-15
Level 4 or above credits	25	-	10-25
Minimum totals	139	12	25

	Heavy Fabrication Strand	Light Fabrication Strand	Steel Construction Strand
Level 3 credits	10	10	10
Level 4 credits	82	82	66
Minimum totals	92	92	76
Qualification total with strand	268	268	252

Requirements for Award of Qualification

Award of NQF Qualifications

Credit gained for a standard may be used only once to meet the requirements of this qualification.

Unit standards and achievement standards that are equivalent in outcome are mutually exclusive for the purpose of award. The table of mutually exclusive standards is provided in section 7 of the New Zealand Qualifications Authority (NZQA) Rules and Procedures publications available at http://www.nzqa.govt.nz/ncea/acrp/index.html.

Reviewed standards that continue to recognise the same overall outcome are registered as new versions and retain their identification number (ID). Any version of a standard with the same ID may be used to meet qualification requirements that list the ID and/or that specify the past or current classification of the standard.

Summary of Requirements

- Core Compulsory standards
- Core Elective – as specified

One of the following strands is required
- Heavy Fabrication Strand
- Light Fabrication Strand
- Steel Construction Strand

Detailed Requirements

Core Compulsory

The following standards are required

Engineering and Technology > Mechanical Engineering > Engineering Core Skills

ID	Title	Level	Credit
2395	Select, use and care for, engineering hand tools	2	4
2396	Select, use and maintain portable hand held engineering power tools	2	4
21905	Demonstrate knowledge of trade calculations and units for mechanical engineering trades	2	4
21908	Demonstrate knowledge of basic mechanics for mechanical engineering trades	2	2
21909	Demonstrate knowledge of fasteners used in mechanical engineering	2	1
21911	Demonstrate knowledge of safety on engineering worksites	2	1
21912	Apply safe working practices on an engineering worksite	2	2
21913	Shift loads in engineering installation, maintenance, and fabrication work	2	2
22900	Demonstrate knowledge of job costing in mechanical engineering	4	2

Engineering and Technology > Mechanical Engineering > Engineering Drawing and Design

ID	Title	Level	Credit
2430	Draw and interpret engineering sketches under supervision	2	4
2431	Draw and interpret engineering drawings under supervision	2	8
2432	Construct engineering plane geometric shapes under supervision	2	3
2433	Create simple engineering drawings using computer aided design (CAD) software	2	6

Engineering and Technology > Mechanical Engineering > Engineering - Fabrication

ID	Title	Level	Credit
16955	Calculate sizes, mass, volumes, and quantities for fabrication	3	4
16956	Demonstrate knowledge of force and stress in fabrications	4	4
25075	Perform basic fabrication operations under supervision	2	12
25704	Develop fabrication patterns for simple three-dimensional objects	3	10
25705	Develop fabrication patterns for complex three-dimensional objects	4	10
25710	Manufacture jigs for fabrication	4	5

ID	Title	Level	Credit
25711	Demonstrate knowledge of basic CNC concepts and applications in the fabrication industry	3	4
25712	Demonstrate knowledge of pressure vessels and pressure piping for fabrication trades	4	4

Engineering and Technology > Mechanical Engineering > Engineering - Materials

ID	Title	Level	Credit
20799	Demonstrate basic knowledge of engineering metals	2	4
20917	Demonstrate basic knowledge of engineering materials	2	2

Engineering and Technology > Mechanical Engineering > Engineering - Measurement

ID	Title	Level	Credit
4433	Select, use, and care for simple measuring devices used in engineering	1	2
4435	Select, use, and care for engineering dimensional measuring equipment	2	3
4436	Select, use, and care for engineering marking-out equipment	2	4

Engineering and Technology > Mechanical Engineering > Maintenance and Diagnostics in Mechanical Engineering

ID	Title	Level	Credit
2401	Safely shut down and isolate machines and equipment	3	3

Engineering and Technology > Mechanical Engineering > Mechanical Assembly

ID	Title	Level	Credit
2387	Assemble mechanical components under supervision	2	2

Engineering and Technology > Mechanical Engineering > Welding

ID	Title	Level	Credit
2683	Cut metals using manual thermal processes	3	4
21907	Demonstrate and apply knowledge of safe welding procedures under supervision	2	3
22906	Demonstrate and apply knowledge of welding low carbon steel	3	3
22907	Demonstrate and apply knowledge of welding aluminium and stainless steel	3	3
25783	Demonstrate knowledge of metal cutting and gouging processes	3	2

Health > Health Studies > Core Health

ID	Title	Level	Credit
6401	Provide first aid	2	1
6402	Provide resuscitation level 2	1	1

Health > Occupational Health and Safety > Occupational Health and Safety Practice

ID	Title	Level	Credit
497	Demonstrate knowledge of workplace health and safety requirements	1	3

Planning and Construction > Construction Trades > Core Construction

ID	Title	Level	Credit
9184	Erect non-notifiable prefabricated scaffolding	3	3

Core Elective
Meet the requirements of all of the following sets
- Core Elective A
- Core Elective B

Core Elective A
A minimum of 12 credits at Level 3

Field	Subfield	Domain
Engineering and Technology	Mechanical Engineering	Welding

Core Elective B
A minimum of 25 credits at Level 3 or above
- Of which a minimum of 10 credits at Level 4 or above

Field	Subfield	Domain
Engineering and Technology	Mechanical Engineering	Metal Surface Finishing
		Welding

Heavy Fabrication Strand
The following standards are required

Engineering and Technology > Mechanical Engineering > Engineering - Fabrication

ID	Title	Level	Credit
25699	Form and shape heavy fabrication materials	4	20
25701	Assemble and join heavy fabrication materials	4	20
25703	Cut heavy fabrication materials	4	15

ID	Title	Level	Credit
25707	Demonstrate and apply knowledge of intermediate heavy fabrication trade practice	3	10
25709	Demonstrate and apply knowledge of advanced heavy fabrication trade practice	4	12
25875	Lay out and mark off heavy fabrication shapes	4	15

Light Fabrication Strand
The following standards are required

Engineering and Technology > Mechanical Engineering > Engineering - Fabrication

ID	Title	Level	Credit
25698	Form and shape light fabrication materials	4	20
25700	Assemble and join light fabrication materials	4	20
25702	Cut light fabrication materials	4	15
25706	Demonstrate and apply knowledge of intermediate light fabrication trade practice	3	10
25708	Demonstrate and apply knowledge of advanced light fabrication trade practice	4	12
25874	Lay out and mark off light fabrication shapes	4	15

Steel Construction Strand
The following standards are required

Engineering and Technology > Mechanical Engineering > Engineering - Fabrication

ID	Title	Level	Credit
25701	Assemble and join heavy fabrication materials	4	20
25703	Cut heavy fabrication materials	4	15
25707	Demonstrate and apply knowledge of intermediate heavy fabrication trade practice	3	10
25709	Demonstrate and apply knowledge of advanced heavy fabrication trade practice	4	12
25713	Demonstrate knowledge of steel construction workshop and worksite operations, procedures and processes	4	4
25875	Lay out and mark off heavy fabrication shapes	4	15

Transition Arrangements

Version 5

Version 5 was issued following a major review of standards and represents a significant rationalisation of the qualification structure.

Changes to structure and content

- Welding strand was removed from this qualification as it did not fulfil industry needs.
- Steel Construction strand was added to this qualification in response to industry demand.
- Title changed to National Certificate in Engineering - Fabrication (Level 4) with strands in Heavy Fabrication, Light Fabrication, and Steel Construction.
- Core Elective section was replaced by the new Core Elective A and Core Elective B.
- Strand Elective sections were removed from the qualification.
- Total credits for the qualification changed from 269-285 to 252 or 268.
- The content of all sections of the qualification was changed to fulfil current industry requirements and standards were updated to reflect changes made at the last review.
- Structure and standards were changed to rationalise assessments of practical skills, and to more clearly distinguish between heavy and light fabrication strands.
- New standards on Computer Numerical Control, Cutting and Gouging, Pressure Vessels, Steel Construction and Pattern Developments were added.
- New structure enables more clearly defined off-job learning program for fabrication apprentices.

For detailed information see Review Summaries on the NZQA website.

People working towards version 4 of this qualification may either complete the requirements for that version or transfer their result to version 5. All new apprentices will be enrolled in version 5. Apprentices who were enrolled in version 4 from June 2008 will be transferred to version 5. Apprentices who were enrolled earlier should complete version 4 prior to 31 December 2014.

This qualification contains standards that replace earlier standards. For the purposes of this qualification, people who have gained credit for the expiring standards are exempt from the requirement to gain credit for the replacement standards – see table below.

Credit for	**Exempt from**
2414	4435
2414, 2416, 2417	25075
2415	25075
2416	2387, 21909
2418, 2419, 2420, 2421	25704, 25706
2418, 2419, 2420, 2421	25704, 25707
2422	25874
2422, 2423, 2424, 2425	25705, 25708
2423	25698
2423	25699
2423, 2424, 2425, 18107	25705, 25709

Credit for	Exempt from
2424	25700
2424	25701
2425	25702
2425	25703
2670	21907
2672, 2682	22906
2824	21911, 21912
4432, 16954	21905
4795	20917
4796	20799
12299	21913
18106	25783
18107	25875

These exemptions will be available up to 31 December 2015.

Competenz will publicise these arrangements on the Competenz website http://www.competenz.org.nz/, in newsletters, and by direct contact with affected parties.

It is not intended that anyone be disadvantaged by this review, and the above arrangements have been designed for a smooth transition. However, anyone who feels they have been disadvantaged may appeal to Competenz at the address below.

Previous versions of the qualification

Version 4 was issued to extend the transition arrangements and to extend the last completion date for version 2. In addition, standards with new classifications and the qualification document format had been updated.

Version 3 was issued in May 2001 after a review of standards. Standard titles, levels and credits were updated.

Version 2 was issued to include transitional credit information for trade certificates, extend the period of registration, and to update Mathematics standards.

Version 1 was issued to include transition for qualifications affected by the change from time served apprenticeships to competency based standards.

Other standard setting bodies whose standards are included in the qualification

New Zealand Industry Training Organisation
NZQA
Opportunity - The Training Organisation

Certification

This certificate will display the logos of NZQA, Competenz and the accredited organisation.

Classification

This qualification is classified according to the NQF classification system and the New Zealand Standard Classification of Education (NZSCED) system as specified below.

DAS Classification		**NZSCED**	
Code	**Description**	**Code**	**Description**
857	Engineering and Technology > Mechanical Engineering > Engineering - Fabrication	030711	Engineering and Related Technologies > Mechanical and Industrial Engineering and Technology > Boiler-making and Welding

Quality Management Systems
Providers and Industry Training Organisations must be accredited by a recognised Quality Assurance Body before they can register credits from assessment against standards. Accredited providers and Industry Training Organisations assessing against standards must engage with the moderation system that applies to those standards. Accreditation requirements and the moderation system are outlined in the associated Accreditation and Moderation Action Plan (AMAP) for each standard.