National Certificate in Refrigeration and Air Conditioning (Level 4)

Level **4**

Credits **284**

This qualification has been reinstated. The last date to meet the requirements is 31 December 2021.

Transition Arrangements

This qualification was reinstated in February 2021 to extend the last date of assessment for programmes leading to this qualification to 31 December 2021.

The last date for entry into programmes leading to the replaced qualification was 31 December 2015. Enrolments are no longer being accepted for this qualification.

This qualification was reviewed and replaced by the New Zealand Certificate in Refrigeration and Air Conditioning (Trade) (Level 4) [Ref: 2366].

For detailed information see Review Summaries on the NZQA website.

This qualification contains Elective B unit standards 2399 and 19355 which expire on 31 December 2016.

Version 5 of this qualification contains standards that have expired or are expiring and have been replaced by later standards. For the purposes of this qualification, people who have gained credit for the replacement standards are exempt from the requirement to gain credit for the expired or expiring standard – see table below.

Credit for	Exempt from
25070, 25071, 25072	15843
28952, 28970	22701
28959, 28963, 29100	22702
28961, 28964	22703
28960, 28965	22704
28962, 28966	22705
28967	22706

NZQF National Qualifications Registration Information

Process	Version	Date	Last Date for Assessment
Registration	1	December 1995	December 1998
Review	2	November 1997	December 2000
Revision	3	September 1998	December 2011
Review	4	February 2007	31 December 2020
Republished	4	August 2012	31 December 2020
Review	5	October 2014	31 December 2020
Republished	5	January 2016	31 December 2020
Republished	5	August 2019	31 December 2020
Reinstated	5	February 2021	31 December 2021

Standard Setting Body

Competenz
PO Box 9005
Newmarket
Auckland 1149

Telephone 0800 526 1800
Email qualifications@competenz.org.nz

National Certificate in Refrigeration and Air Conditioning (Level 4)

Level 4

Credits 284

Purpose

This qualification is for technicians in the Refrigeration and Air Conditioning (RAC) discipline of engineering. People awarded with this qualification are able to install, maintain, service, and commission refrigeration and air conditioning plant and equipment in accordance with industry specifications.

The qualification consists of a compulsory section and two elective sections.

The compulsory section covers the following:

- industrial safety and first aid;
- basic mechanical engineering trade knowledge and skills;
- brazing and welding;
- trade mathematics;
- basic electrical knowledge;
- RAC principles;
- RAC installation and maintenance practices;
- electrical and electronic principles relevant to RAC;
- application of design principles to commercial RAC installation;
- requirements for Electrical Service Technician (EST-B) registration.

Standards in Elective A cover installation, commissioning, servicing, and maintenance of either:

- commercial refrigeration and/or air conditioning equipment as used in retail food outlets, truck and shipping-containers, horticultural cool rooms, controlled atmosphere fruit stores, and split system air conditioning in commercial buildings; or
- industrial single or multi-staged refrigeration and air conditioning systems used in freezing works, breweries, food processing, chemical plants, or similar enterprises, and typically using ammonia refrigerant.

Elective B allows technicians to select the most appropriate knowledge and skills, relevant to their employment situation.

This qualification may be achieved through an apprenticeship, typically lasting four years, or by progression from the National Certificate in Spilt System Air Conditioning (Level 3) [Ref: 1242]. It may lead to the National Certificate in Refrigeration and Air Conditioning (Level 5) [Ref: 0720].

Special Notes

1. The work of RAC technicians requires electrical registration under the provisions of the Electricity Act 1992 and the Electricity Regulations 1997. The minimum registration requirement is Electrical Service Technician B (EST-B), and this must be obtained from the Electrical Workers Registration Board (EWRB) prior to application for the National Certificate in Refrigeration and Air Conditioning (Level 4) [Ref: 0130].

2. To achieve EST-B registration, candidates must:
   - attend EST-A and EST-B courses provided by an EWRB-approved training provider (most Polytechnics run classes, and The Open Polytechnic of New Zealand runs correspondence courses);
   - pass the EWRB examinations and practical assessments for EST-A and EST-B;
   - provide evidence of safety training, testing, first aid, and CPR (usually included with Polytechnic courses);
   - provide evidence of relevant electrical work experience satisfactory to the EWRB (usually employer's confirmation of the nature of the work carried out);
   - apply to EWRB for EST-B registration with the appropriate fee.

3. Credit for unit standards 10933 to 10940 can be awarded by providers or Competenz upon achievement of passes in the EST-A and EST-B examinations and practical assessments.

4. People seeking award of this qualification must first provide Competenz with proof that the EWRB registration requirement has been satisfied. Competenz is responsible for verifying registration and forwarding all results to NZQA for award of the qualification.

5. Registered Electricians wishing to achieve this qualification may apply to Competenz for recognition of current competence in the following electrical unit standards: 750, 10933, 10934, 10935, 10936, 10937, 10938, 10939, 10940, 15843, and 15847.

Credit Range

	Compulsory	**Elective A**	**Elective B**
Level 1 credits	1	-	-
Level 2 credits	55	-	-
Level 3 credits	110	0-50	0-28
Level 4 or above credits	-	40-90	0-28
Minimum totals	166	90	28

Requirements for Award of Qualification

This qualification will be awarded to people who:

- have met the requirements of the Core Compulsory section, and Elective Sections A and B; and
- provided Competenz with evidence of registration by the Electrical Workers Registration Board as Electrician or Electrical Service Technician B.

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 the Qualifications Authority *Rules and Procedures* publications available at www.nzqa.govt.nz/ncea/.

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.

Detailed Qualification Requirements

Compulsory

All the standards listed below are required.

Field Engineering and Technology
Subfield Electrical Engineering
Domain Core Electrical

Id	Title	Level	Credit
750	Demonstrate knowledge of electrical test instruments and take measurements	2	2
10933	Demonstrate knowledge of electrical theory for Electrical Service Technicians – A	3	4
10934	Demonstrate knowledge of safety, protection, and testing for Electrical Service Technicians – A	3	2
10935	Demonstrate knowledge of regulations and codes of practice for Electrical Service Technicians – A	3	2
10936	Demonstrate practical skills required for Electrical Service Technicians – A	3	3
10937	Demonstrate knowledge of electrical theory for Electrical Service Technicians – B	3	3
10938	Demonstrate knowledge of appliance isolation, connection, and testing procedures for EST – B	3	2
10939	Demonstrate knowledge of regulations and codes of practice for Electrical Service Technicians – B	3	2
10940	Demonstrate practical skills required for Electrical Service Technicians – B	3	3
15843	Demonstrate knowledge of magnetism and electricity	2	15
15847	Demonstrate knowledge of mathematics and mechanics for electrical trades	2	4

Subfield Mechanical Engineering
Domain Engineering - Materials

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

Domain 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
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

Domain Refrigeration and Air Conditioning

Id	Title	Level	Credit
19666	Demonstrate knowledge of ozone and how it relates to the refrigeration and air conditioning industry	3	3
22701	Demonstrate knowledge of refrigeration and air conditioning principles and applications	3	15
22702	Install and commission commercial refrigeration and air conditioning	3	15
22703	Apply knowledge of electrical and electronics principles in RAC	3	15
22704	Maintain and service refrigeration and air conditioning systems	3	20
22705	Apply design principles to commercial RAC systems installation	3	15
22706	Assemble commercial refrigeration and/or air conditioning system components under supervision	2	10

Domain Welding

Id	Title	Level	Credit
2679	Join metals using torch brazing and soldering	3	6
21907	Demonstrate and apply knowledge of safe welding procedures under supervision	2	3

Field Health
Subfield Health Studies
Domain Core Health

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

Elective A
A minimum of 90 credits is required from the following standards, with a minimum of 40 credits at Level 4 or above.

Field Engineering and Technology
Subfield Mechanical Engineering
Domain Refrigeration and Air Conditioning

Id	Title	Level	Credit
3831	Assemble and fabricate commercial refrigeration and/or air conditioning system components	3	10
3837	Modify industrial refrigeration systems	3	20
3841	Commission commercial refrigeration and/or air conditioning systems	4	20
3842	Commission industrial refrigeration systems	5	25
3846	Maintain commercial refrigeration and/or air conditioning systems	3	20
3847	Perform maintenance operations on industrial refrigeration systems	4	20
3851	Service commercial refrigeration and/or air conditioning systems	4	20
3852	Service industrial refrigeration systems	4	25
22707	Install commercial refrigeration and/or air conditioning systems	3	20

Elective B
A minimum of 28 credits at Level 3 or above is required from the following standards or domains.

Field	Subfield	Domain
Engineering and Technology	Electrical Engineering	Any
	Mechanical Engineering	Heating, Ventilating, and Air Conditioning
		Refrigeration and Air Conditioning
		Welding

Field Engineering and Technology
Subfield Design
Domain Design - Computer Graphics

Id	Title	Level	Credit
19355	Produce scale production drawings using computer aided draughting (CAD) programs	3	8

Subfield Electrical Engineering
Domain Core Electrical

Id	Title	Level	Credit
5926	Demonstrate knowledge of programmable logic controllers (PLCs)	4	5

Subfield Mechanical Engineering
Domain Maintenance and Diagnostics in Mechanical Engineering

Id	Title	Level	Credit
2399	Dismantle, inspect, assemble and test components under supervision	3	10

Field Service Sector
Subfield Service Sector Skills
Domain Service Sector - Core Skills

Id	Title	Level	Credit
376	Employ customer service techniques for differing customer behaviours in a given situation	3	2

Transition Arrangements

Version 4
This qualification was reviewed in conjunction with a major review of standards in the Refrigeration and Air Conditioning domain, which led to significant changes in the qualification.

Changes to structure and content

- Credit has been reduced from 333-365 credits to 284 following more focussed selection of recently reviewed standards.
- The Compulsory section has been reduced from 283 to 166 credits, using standards more appropriate to industry today.
- The minimum credit total for Elective A has increased from 35 to 90.
- Elective B, which was open to standards from anywhere on the National Qualifications Framework, has been tightened to a more focussed selection of standards and domains, and credit for this section was increased from 15 to 28.
- Optional Elective C has been removed. The electrical standards have been updated and moved to the compulsory section.
- Many standards have been replaced with recently reviewed standards, particularly in Refrigeration and Air Conditioning, and in Mechanical Engineering.
- The new National Certificate in Split System Air Conditioning (Level 3) [Ref: 1242] has been included in the pathway description.

For detailed information see Review Summaries on the Qualifications Authority website.

All new trainees or apprentices from 2007 will be enrolled in version 4 of the qualification.

People currently working towards version 3 are encouraged to complete that version, and courses to enable them to do so are being planned for 2007 and 2008.

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.

Credit for	Exempt from
2670	21907
2824	21911 and 21912
3824	22705
3829	22706
3830	22706
3834 and 3839	22702
3835 and 3836	22707
3844 and 3849	22704
4795	20917
4796	20799
12299	21913

These exemptions will be available up to 31 December 2011.

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.

Reverse transition

Reverse transition has been included for version 5 of this qualification to allow candidates to complete the qualification using the replacement standards.

Version 5 of this qualification contains a standard that has expired and has been replaced by later standards. For the purposes of this qualification, people who have gained credit for the replacement standards are exempt from the requirement to gain credit for the expired standard – see table below.

Credit for	Exempt from
25070, 25071, 25072	15843

Previous versions of the qualification

Version 3 was issued to clarify the requirements for registration as Electrical Service Technician A and B with the Electrical Workers Registration Board (EWRB).

Version 2 was issued to improve flexibility and replace electrical standards leading to the appropriate electrical registration.

Version 1 was issued to replace the Trade Certificates in Refrigeration; and Heating, Ventilating and Air Conditioning.

Other standard setting bodies whose standards are included in the qualification

The Skills Organisation
NZQA

Certification

The certificate will display the logos of NZQA and Competenz.

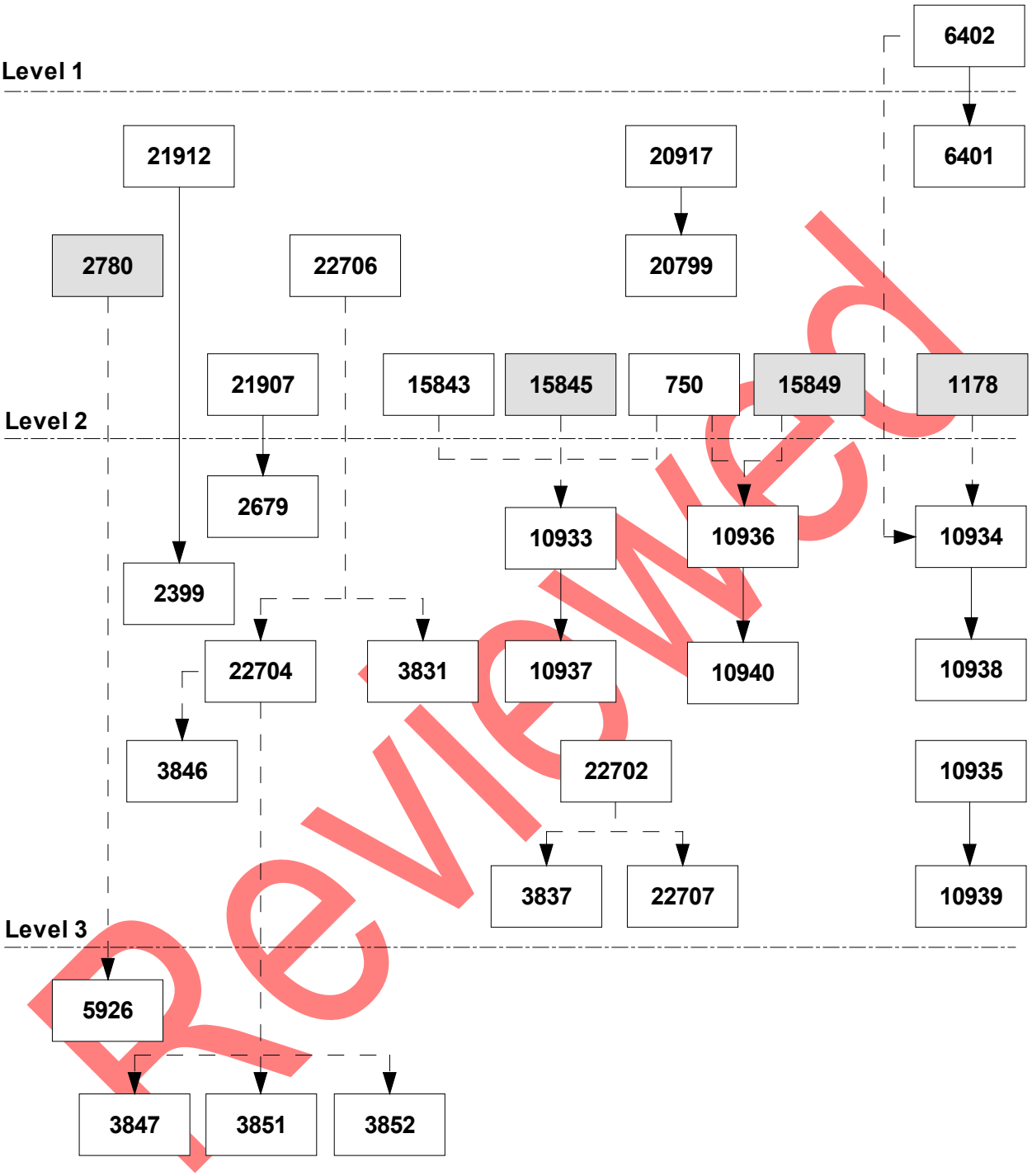
Classification

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

NQF Classification		**NZSCED**	
Code	**Description**	**Code**	**Description**
848	Engineering and Technology/Mechanical Engineering/Refrigeration and Air Conditioning	031315	Engineering and Related Technologies/Electrical and Electronic Engineering and Technology/Refrigeration, Heating and Air Conditioning

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 Consent and Moderation Requirements (CMR) for each standard.

Prerequisite Diagram



Key

- Recommended but not in Qualification
- Prerequisite
- Recommended