

## National Certificate in Metal Casting (Technology)

**Level** 4

**Credits** 241

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This qualification has been replaced by the New Zealand Certificate in Mechanical Engineering (Trade) (Level 4) with strands in Fitting and Machining, General Engineering, Machining, Maintenance Engineering, Metal Forming, and Toolmaking [Ref: 2714].

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.

This qualification contains expiring unit standards for which replacement unit standards have now been registered. Candidates who have gained credit for the replacement unit standards are exempt from the requirement to gain credit for the expiring unit standards.

Credit for	Exempt from
27205, 27206	2410
29655	2430
29653	2432
29550	20799
29549	20917
29551	4797
29552	4800
29671, 29673	21906
29634	2364
29634	2365
29634	2366
29635	2367

Credit for	Exempt from
29635	2368
29635	2369
30265	17602

For detailed information see [Review Summaries](#) on the NZQA website.

## NQF Registration Information

Process	Version	Date	Last Date for Assessment
Registration	1	December 1995	December 2001
Revision	2	September 1998	December 2001
Review	3	December 1999	December 2011
Review	4	December 2006	December 2022
Review	5	July 2015	December 2022
Republication	5	May 2016	December 2022
Republication	5	October 2017	December 2022

## Standard Setting Body

Competenz  
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## National Certificate in Metal Casting (Technology)

**Level** 4

**Credits** 241

### Purpose

This qualification is designed to enable trainees/apprentices employed in the Metal Casting (Technology) discipline of Engineering to gain recognition for the relevant skills and knowledge required by industry expressed in terms of competency.

The qualification represents a set of foundation skills for mechanical engineering and specific skills in metal casting and engineering pattern making. Metal Casting (Technology) embraces Moulding and Patternmaking skills. Technological advances have initiated a convergence of these historical trades in that it is impossible for either to exist in isolation. The qualification profile takes cognisance of this industry trend. People awarded this qualification are able to use the tools and make castings or patterns/tooling applicable to metal casting.

This qualification offers an opportunity for those who have completed the National Certificate in Mechanical Engineering (Level 2) [Ref: 1220] to specialise in metal casting. It may lead to the National Certificate in Mechanical Engineering (Level 5), which is expected to be available in 2007, or the National Diploma in Engineering (Level 6) with strands in Mechanical Engineering, Production Engineering, and an optional Practical Endorsement strand [Ref: 0534].

### Credit Range

	Compulsory	Elective
Level 1 credits	3	-
Level 2 credits	29	0-94
Level 3 credits	9	0-160
Level 4 credits	-	40-121
Minimum totals	41	200

### Requirements for Award of Qualification

This qualification will be awarded to people who have met the requirements of the compulsory and elective sections.

#### Compulsory

All the unit standards listed are required.

#### Elective

A minimum of 200 credits are required, from the unit standards listed, of which a minimum of 40 credits must be at level 4.

**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/](http://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 unit standards listed below are required.

Field Engineering and Technology  
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 – Measurement

Id	Title	Level	Credit
4433	Select, use, and care for simple measuring devices used in engineering	1	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
21905	Demonstrate knowledge of trade calculations and units for mechanical engineering trades	2	4
21911	Demonstrate knowledge of safety on engineering worksites	2	1
21912	Apply safe working practices on an engineering worksite	2	2

Domain Engineering Drawing and Design

Id	Title	Level	Credit
2430	Draw and interpret engineering sketches under supervision	2	4

Domain Maintenance and Diagnostics in Mechanical Engineering

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

Domain Metal Casting

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
2373	Work safely with molten metals	2	3

Field Health  
 Subfield Health Studies  
 Domain Core Health

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
6400	Manage first aid in emergency situations	3	2
6401	Provide first aid	2	1
6402	Provide resuscitation level 2	1	1

Subfield Occupational Health and Safety  
 Domain Occupational Health and Safety Practice

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
17602	Apply hazard identification and risk assessment procedures in the workplace	3	4

**Elective**

A minimum of 200 credits are required from the following unit standards, of which a minimum of 40 credits must be at level 4.

Field Engineering and Technology  
 Subfield Mechanical Engineering  
 Domain Engineering – Materials

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
2383	Carry out heat treatment of metal parts under supervision	2	2
4797	Demonstrate knowledge of the composition of engineering metals	3	5
4799	Test the physical properties of engineering metals	4	4
4800	Demonstrate knowledge of heat treatment for engineering steels	4	5
4801	Demonstrate knowledge of heat treatment for engineering non-ferrous metals	4	4

Domain Engineering Core Skills

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
21906	Perform basic mechanical engineering machining operations under supervision	2	12
21913	Shift loads in engineering installation, maintenance, and fabrication work	2	2

## Domain Engineering Drawing and Design

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
2431	Draw and interpret engineering drawings under supervision	2	8
2432	Construct engineering plane geometric shapes under supervision	2	3
2433	Create engineering drawings using computer aided design (CAD) software	2	6
2436	Create simple three dimensional engineering models under supervision	3	5

## Domain Engineering Patternmaking

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
2364	Make wooden patterns and/or tooling under supervision for use in industry	3	25
2365	Make metal patterns and/or tooling under supervision for use in industry	3	25
2366	Make composites patterns and/or tooling under supervision for use in industry	3	25
2367	Make wooden patterns and/or tooling for use in industry	4	20
2368	Make metal patterns and/or tooling for use in industry	4	20
2369	Make composites patterns and/or tooling for use in industry	4	20

## Domain Maintenance and Diagnostics in Mechanical Engineering

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
2410	Describe and use non-destructive testing (NDT) technology	4	8

## Domain Metal Casting

Id	Title	Level	Credit
2371	Produce metal castings using gravity die casting machine	2	5
2374	Prepare and mix sand for metal casting processes	3	20
2375	Produce moulds and cores by hand for metal casting processes	4	25
2376	Produce moulds and cores using machines for metal casting processes	2	10
2377	Produce molten metal using metal melting furnace	3	20
2378	Pour molten metal into moulds	2	5
2379	Finish metal castings	2	15
2380	Inspect and test metal castings	3	15
2381	Inspect and repair refractory linings and crucibles used in metal casting processes	3	15
2382	Produce expendable wax patterns for lost wax casting method	2	5
2385	Repair porosity in metal castings using the impregnation method	2	3
2386	Produce ceramic shell moulds for use in the investment casting process in metal casting	3	15
19449	Prepare for and perform chemical analysis using optical emission spectrometry equipment	4	5
19741	Demonstrate knowledge of common die casting defects	2	5

Domain Welding

Id	Title	Level	Credit
21907	Demonstrate and apply knowledge of safe welding procedures under supervision	2	3

## Transition Arrangements

### Version 4

Version 4 was issued following the review of Metal Casting (Technology) unit standards and also to fulfil training needs of the metal casting industry sector.

#### Changes to structure and content

- Titles, levels, and credits of reviewed unit standards have been updated.
- Level 4 has been removed from the title of the qualification.
- Metal Casting unit standard 2372 has been replaced by unit standard 21471.
- Unit standard 2373 has been moved from the Engineering Core Skills domain in the elective section to the Metal Casting domain in the compulsory section.
- Unit standard 2383 has been moved from Engineering Core Skills domain to the Engineering - Materials domain in the elective section.
- Unit standards 2397, 2398 and 2399 have been removed from the elective section.
- Welding unit standard 2670 has been replaced by unit standard 21907.
- Engineering Core Skills unit standard 2824 has been replaced by unit standards 21911 and 21912.
- Engineering Measurement unit standards 4432 and 4434 from the compulsory section and Mathematics unit standards 5223, 5226, 5228, and 5251 in Elective A have been replaced by unit standard 21905 which is now compulsory.



- Engineering Materials unit standards 4795 and 4796 have been replaced by unit standards 20917 and 20799 respectively in the compulsory section.
- Engineering Materials unit standard 4798 has been removed from the elective section of the qualification, as this unit standard is now obsolete.
- Engineering machining and tool making unit standard 11661 from the compulsory section and 11662, 11663, and 11664 in Elective A have been replaced by unit standard 21906 which is in the elective section.
- Occupational Health and Safety unit standard 17602 and Core Health unit standards 6400, 6401, and 6402 have been added to the compulsory section.
- Metal casting unit standards 19449, 19741, and 19742 have been added to elective unit standards.
- Elective B has been removed from the qualification.
- Minimum credit total for elective section has decreased from 255 to 200.
- Credit total for this qualification has decreased from 307 to 241 credits.

People currently working towards version 3 of this qualification may either complete the requirements for that version or transfer their results to this version of the qualification. The last date for award of version 3 is 31 December 2011. For those who wish to transfer to version 4, the following exemptions apply:

Credit for	Exempt from
4432 and 4434	21905
5223 and 5226 and 5251	21905
5226 and 5228 and 5251	21905
11661 or 11662 or 11663 or 11664	21906

For detailed information see [Review Summaries](#) on the Qualifications Authority website.

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
2372	21471
2670	21907
2824	21911 and 21912
4795	20917
4796	20799

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 3 was issued to improve the flexibility of the qualification by combining elective A and B; removing level 5 unit standard 2384; moving some of the compulsory unit standards to the elective section and adding some unit standards to cover mathematical skills and engineering core skills.



Version 2 was published following a revision; there was no change to qualification requirements.

Version 1 replaced the Trade Certificates and Advanced Trade Certificates in Moulding, and Patternmaking. Transition for those qualifications expired in November 1997.

Any person or organisation may contribute to the review of this qualification by sending feedback to the standard setting body at the above address.

The review of this qualification is planned to take place in 2011.

### Other standard setting bodies whose standards are included in the qualification

NZQA  
New Zealand Industry Training Organisation

### Certification

The certificate will display the logos of the Qualifications Authority and Competenz.

### Classification

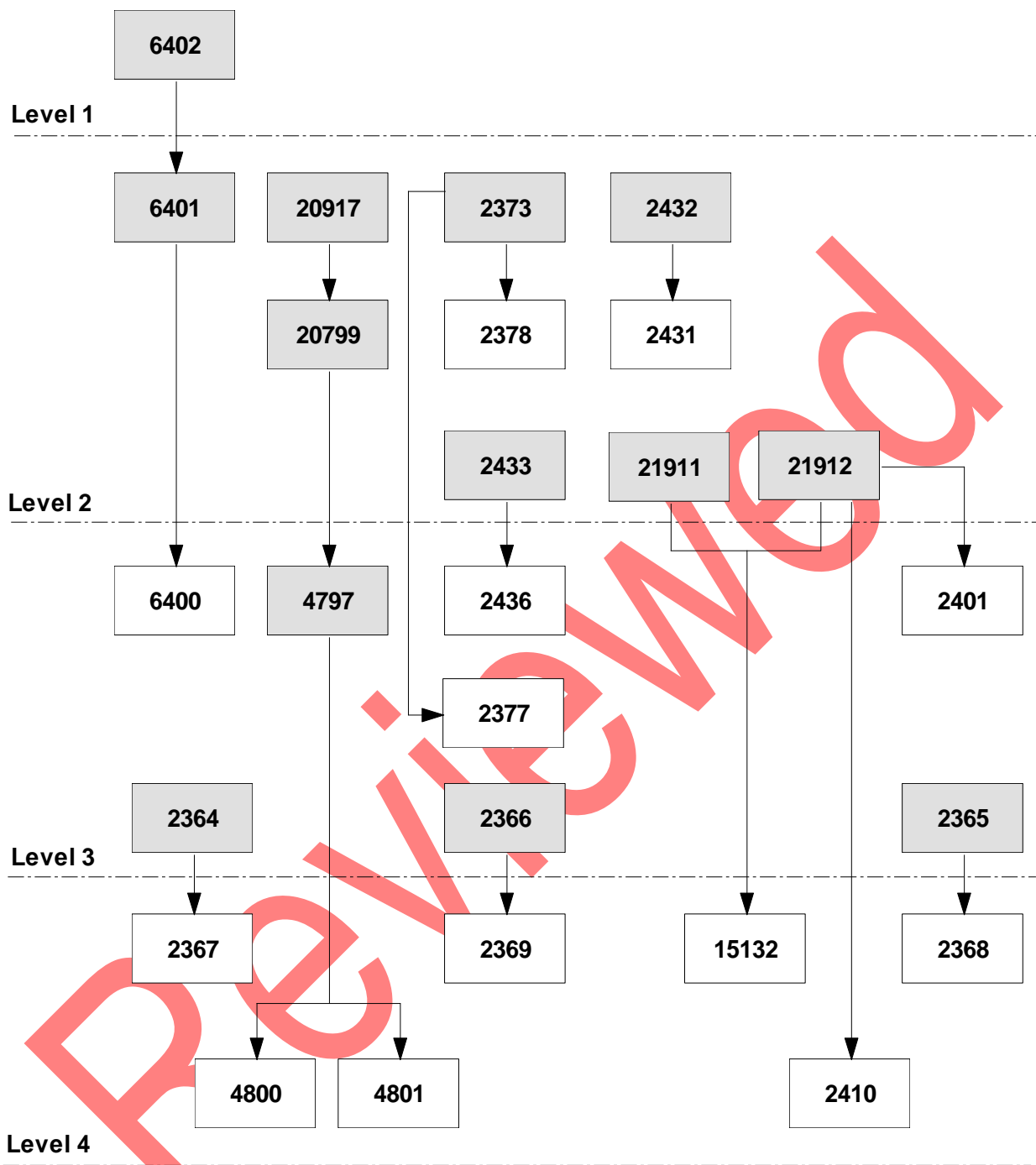
This qualification is classified according to the NQF classification system and the New Zealand Standard Classification of Education (NZSCED) system as specified below.

DAS Classification		NZSCED	
Code	Description	Code	Description
774	Engineering and Technology/Mechanical Engineering/Metal Casting	030713	Engineering and Related Technologies/Mechanical and Industrial Engineering and Technology/Metal Casting and Pattern Making

#### 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.

# Prerequisite Diagram



## Key

