

<b>Title</b>	<b>Prepare for and perform chemical analysis using optical emission spectrometry equipment</b>		
<b>Level</b>	<b>4</b>	<b>Credits</b>	<b>5</b>

<b>Purpose</b>	People credited with this unit standard are able to: identify documentation relating to sample preparation equipment and optical emission spectrometry (OES) equipment and processes; demonstrate knowledge of sample preparation equipment and consumable materials; prepare for and perform spectrochemical analysis; investigate and report results; and perform maintenance procedures.
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<b>Classification</b>	Mechanical Engineering > Metal Forming
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<b>Available grade</b>	Achieved
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### Guidance Information

- 1 References and legislation  
Health and Safety at Work Act 2015.  
Hazardous Substances and New Organisms Act 1996.
- 2 Definitions  
*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.  
*Reference material* (also known as control samples) refers to a material or substance with one or more properties of which are sufficiently well established to be used for the calibration of an apparatus, the assessment of a measurement method, or for assigning values to materials.  
*Spectrochemical analysis* refers to the performance of a chemical analysis using the technique of optical emission spectroscopy.  
*Workplace procedures* refer 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  
All activities must comply with applicable workplace procedures and must be consistent with accepted industry practice.

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## Outcomes and performance criteria

### Outcome 1

Identify documentation relating to sample preparation equipment and optical emission spectrometry (OES) equipment and processes.

#### Performance criteria

1.1 Documentation and information for sample preparation equipment are identified.

Range manufacturer's information, equipment operating manuals, safety procedures, operating instructions, maintenance procedures, testing procedures.

1.2 Documentation and information for OES equipment are identified.

Range manufacturer's information, equipment operating manuals, safety procedures, operating instructions, maintenance procedures, testing procedures.

1.3 Certification documentation for OES processes is identified.

Range test certificates, certification from third party auditing bodies, reference material analysis certificates.

### Outcome 2

Demonstrate knowledge of sample preparation equipment and consumable materials.

#### Performance criteria

2.1 Potential hazards and safety equipment are identified.

2.2 Preparation equipment is described in terms of how samples are prepared for analysis.

Range lishers, grinders, lathes;  
evidence of two is required.

2.3 Consumable materials are described in terms of their specifications and function in the analysis process.

Range coolants, gases, grinding materials, tool tips.

### Outcome 3

Prepare to perform spectrochemical analysis.

**Performance criteria**

- 3.1 Documentation for the analysis, both for guidance and recording purposes, is assembled in the work area before the spectrochemical analysis commences.
- 3.2 Equipment to be used in the analysis is described.
- Range analysis equipment, preparation equipment, consumable materials.
- 3.3 Reference materials are obtained, handled, and stored.
- 3.4 Equipment is set up.
- Range equipment cleaning, control sample analysis, standardisation.
- 3.5 Samples to be analysed are approved as suitable for analysis.
- Range a minimum of one metal type from – irons, steels, non-ferrous metals.
- 3.6 Samples are uniquely identified.
- Range any of – tagging, labelling, stamping.
- 3.7 Samples are prepared according to metal type requirements in a manner which ensures suitability for analysis.
- Range any of – finishing, grinding, turning.
- 3.8 Prepared sample quality is checked to ensure suitability for analysis.
- Range analysis surface is free of – cracks, holes, pinholes, inclusions, defects, curvature, bevels, water.

**Outcome 4**

Perform spectrochemical analysis.

**Performance criteria**

- 4.1 The process of analysis is carried out.
- 4.2 Data relevant to the analysis is recorded.
- 4.3 Data from the analysis is verified as meeting the accuracy and precision requirements specified in workplace procedures.
- Range may include but is not limited to – quality control checks, statistical process control graphs, reference material analysis.

**Outcome 5**

Investigate and report results.

**Performance criteria**

- 5.1 Any deviations from the expected range of results are investigated and appropriate actions are taken.
- 5.2 Results are reported and stored.

**Outcome 6**

Perform maintenance procedures.

**Performance criteria**

- 6.1 Equipment is cleaned to ensure the complete removal of all residues and is left in a ready-to-use condition.
- 6.2 Any equipment which is worn or damaged, is identified and reported, and replaced, repaired, or disposed of.
- 6.3 Consumable materials used are clearly labelled and stored, and necessary replenishments required are reported.
- 6.4 Waste material is labelled and disposed of.

<b>Planned review date</b>	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 August 2002	31 December 2012
Review	2	19 May 2006	31 December 2016
Rollover and Revision	3	17 November 2011	31 December 2022
Review	4	15 September 2016	N/A
Revision	5	23 November 2017	N/A

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

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**Comments on this unit standard**

Please contact Competenz [qualifications@competenz.org.nz](mailto:qualifications@competenz.org.nz) if you wish to suggest changes to the content of this unit standard.