Title	**Demonstrate and apply knowledge of the construction, function and application of seals in mechanical engineering**		
Level	**3**	**Credits**	**2**

Purpose	This unit standard covers basic static and dynamic seal knowledge, removal, fitting and making for mechanical engineering trades. People credited with this unit standard are able to demonstrate knowledge of the function; construction; and application of static and dynamic seals in mechanical engineering; and select; replace; and make simple seals.

Classification	Mechanical Engineering > Maintenance and Diagnostics in Mechanical Engineering

Available grade	Achieved

Prerequisites	Unit 21912 *Apply safe working practices on an engineering worksite*, or demonstrate equivalent knowledge and skills.

Guidance Information

1 References
Health and Safety at Work Act 2015.
Culley, R. (2003). *Fitting and Machining*. Melbourne, Australia, RMIT Publishing.

2 Definitions
Accepted industry practice – approved codes of practice and standardised procedures accepted by the wider mechanical engineering industry sectors as examples of best practice.

3 Related unit standards
This unit standard is one of a set of unit standards covering seals used in mechanical engineering:
- Unit 30284, *Demonstrate and apply knowledge of the construction, function, and application of seals in mechanical engineering* (Level 3); an introductory standard for general use across mechanical engineering trades.
- Unit 30285, *Demonstrate knowledge of and replace and test dynamic seals in machines and equipment* (Level 4); a dynamic seal specific standard for those working in assembly and maintenance of components.
- Unit 30286, *Demonstrate knowledge of, and replace and test static seals in machines and equipment* (Level 4); a static seal specific standard for those working in assembly and maintenance of components.

Outcomes and Performance criteria

Outcome 1

Demonstrate knowledge of the function of seals in mechanical engineering.

Performance criteria

1.1 Four functions of seals in components and assemblies are explained.

1.2 Static and dynamic seal types are defined and compared in terms of sealing principle.

Outcome 2

Demonstrate knowledge of the construction and application of static seals.

Range flat sheet and composite gaskets; sealing washers; O-rings; metal-to-metal joints, sealing compounds.

Performance criteria

2.1 The identification, safe handling and disposal of asbestos and other hazardous gaskets is explained in accordance with accepted industry practice.

2.2 Static seal types are described in terms of common material composition and construction.

2.3 Static seal types are matched to typical applications and the matching reasons are explained in accordance with accepted industry practice.

Outcome 3

Demonstrate knowledge of construction and application of dynamic seals.

Range gland packing, piston rings, O-rings, single and double lip seals, labyrinth seals, mechanical seals.

Performance criteria

3.1 Dynamic seal types are described in terms of material, construction and sealing principle.

3.2 Dynamic seal types are matched to typical applications and the matching reasons are explained in accordance with accepted industry practice.

3.3 Mechanical seals are compared to gland packing in terms of advantages and disadvantages.

Outcome 4

Select and replace simple static and dynamic seals.

Range three static seals, two dynamic seals.

Performance criteria

4.1 Existing seals are removed in accordance with accepted industry practice.

4.2 Seal surfaces are inspected for damage and cleaned and prepared for seal fitting in accordance with accepted industry practice.

4.3 Seal surface flatness is measured to confirm conformance to specified tolerances or accepted industry practice.

4.4 Seal seating or housing size is measured to determine seal size in accordance with accepted industry practice.

4.5 Replacement seals are selected to meet job requirements using seal manufacturer's technical seal selection information.

4.6 Replacement seals are checked and inspected for defects prior to fitting in accordance with accepted industry practice.

4.7 Replacement seals are fitted to components in accordance with accepted industry practice.

Outcome 5

Make simple seals.

Performance criteria

5.1 An O-ring seal is made from an O-ring seal kit to job requirements.

5.2 A gasket is made from gasket sheet material to job requirements.

Planned review date	31 December 2022

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	20 July 2017	N/A

Consent and Moderation Requirements (CMR) reference	0013

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

Comments on this unit standard

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