

Title	Demonstrate knowledge of, and apply, mathematics in the water industry		
Level	3	Credits	4

Purpose	People credited with this unit standard are able to: describe the SI units used in the water industry; perform calculations using prefixes in the SI system of measurement; use formulae to solve for unknown variables; calculate flow rate; calculate detention or storage time given a flow rate and fixed volume vessel; describe solution strengths; and perform calculations relating to diameter of pipes, flow, and velocity.
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Classification	Water Industry > Water - Generic
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Available grade	Achieved
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Explanatory notes

Definition

SI refers to *Système International d'unités* or *International System of Units*, which comprises a coherent system of measurement based on seven base units for measuring length, mass, time, electric current, temperature, quantity of matter, and luminous intensity. For the purpose of this unit standard, SI units include those for length, mass, and time.

Outcomes and evidence requirements

Outcome 1

Describe the SI units used in the water industry.

Evidence requirements

1.1 The units used in the SI metric system are described in terms of their applications in the water industry.

Range length, area, time, volume, mass, velocity, flow rate, pressure, temperature.

Outcome 2

Perform calculations using prefixes in the SI system of measurement.

Evidence requirements

2.1 Calculations are performed using appropriate prefixes, and answers are converted into other prefix units using the standard prefix ranges.

Range three of – mega, kilo, milli, micro, nano.

Outcome 3

Use formulae to solve for unknown variables.

Evidence requirements

3.1 A simple formula is transposed to make the unknown variable the subject of the equation and is then used to solve for the unknown variable.

Range volume calculation of a cylinder or rectangle unit, time to fill a volume.

Outcome 4

Calculate flow rate.

Evidence requirements

4.1 Flow rate is calculated accurately.

Outcome 5

Calculate detention or storage time given a flow rate and fixed volume vessel.

Evidence requirements

5.1 Calculations are performed for different flow rates and volumes of detention or storage.

Range time to fill or empty, changes in volume, changes in flow rate.

Outcome 6

Describe solution strengths.

Evidence requirements

6.1 Solutions are described in terms of the solutions encountered, concentration calculations, and the units used to describe them.

Range units may include – g/m³, mg/m³, mg/l, %, ppm, cfu/100ml, kg/day

Outcome 7

Perform calculations relating to diameter of pipes, flow, and velocity.

Evidence requirements

7.1 Sectional area and velocity are calculated from the pipe diameter and flow rate.

Range evidence is required for at least three common pipe sizes.

Planned review date	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	27 May 2002	31 December 2018
Revision	2	12 February 2003	31 December 2018
Review	3	19 September 2008	31 December 2018
Review	4	16 March 2017	N/A

Consent and Moderation Requirements (CMR) reference	0101
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

Please note

Providers must be granted consent to assess against standards (accredited) by NZQA, before they can report credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be granted consent to assess against standards by NZQA before they can register credits from assessment against unit standards.

Providers and Industry Training Organisations, which have been granted consent and which are assessing against unit standards must engage with the moderation system that applies to those standards.

Requirements for consent to assess and an outline of the moderation system that applies to this standard are outlined in the Consent and Moderation Requirements (CMR). The CMR also includes useful information about special requirements for organisations wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.

Comments on this unit standard

Please contact the Infrastructure Industry Training Organisation qualifications@connexis.org.nz if you wish to suggest changes to the content of this unit standard.