

Title	Demonstrate knowledge of fusion jointing of polyethylene pipes for water networks		
Level	4	Credits	5

Purpose	People credited with this unit standard are able to demonstrate knowledge of: polyethylene pipe; electrofusion jointing; and butt fusion jointing, for water networks.
----------------	--

Classification	Infrastructure Works > Pipeline Construction and Maintenance
-----------------------	--

Available grade	Achieved
------------------------	----------

Guidance Information

- 1 Evidence presented for assessment against this unit standard must be consistent with safe working practices and be in accordance with applicable legislative and industry requirements.
- 2 Legislation and industry standards relevant to this unit standard include but are not limited to:
Health and Safety at Work Act 2015; and any subsequent amendments and replacements;
AS/NZS and ISO standards available at <https://www.standards.govt.nz/>; and
PIPA NZ (Plastics Industry Pipe Association of New Zealand) guidelines available at <https://www.pipa.com.au/technical/pop-guidelines>.
- 3 Definition
Industry requirements refer to relevant policies, processes, methodologies, industry codes of practice, site specific health and safety plans, standard operating procedures, site safety plans, quality plans, work plans, traffic management plans, contract work programmes, job safety analysis, safe work method statements, job instructions, manufacturer's requirements, contract specifications, manuals, procedural documents, Waka Kotahi New Zealand Transport Agency specifications and guidelines.
- 4 This unit standard may lead to Unit 31524 *Carry out butt fusion jointing on polyethylene pipes for water networks* and/or Unit 31525 *Carry out electrofusion jointing on polyethylene pipes for water networks*. Achievement of this unit standard is not sufficient to demonstrate competence in either butt fusion or electrofusion jointing.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of polyethylene pipe for water networks.

Performance criteria

- 1.1 Standards relevant to own work are described in terms of purpose and application in fusion jointing.
- Range AS/NZS standards, ISO standards, PIPA guidelines, company requirements and contract specifications.
- 1.2 Polyethylene pipes of different diameters are described in terms of their handling, storage, inspection, and positioning requirements.
- Range 16mm to 250mm, 280mm to 450mm, 500mm to 630mm, over 630mm.
- 1.3 Pipe dimensions are described in terms of measurement, and acceptable limits for damage and non-conformance to standard dimensions.
- Range measurements include – outside diameter, wall thickness, ovality, pipe end reversion, pressure rating (PN).
- 1.4 Polyethylene pipe material is identified and described in terms of application, operating pressure, and life expectancy.
- Range evidence of two different material types is required.

Outcome 2

Demonstrate knowledge of electrofusion jointing of polyethylene pipes for water networks.

Performance criteria

- 2.1 The process of electrofusion is described, and electrofusion jointing equipment and fittings are described in terms of function in the process, maintenance, and storage requirements.
- Range equipment includes– electrofusion control units, rounding clamps, alignment clamps, pin configurations, peeling tools, top loading tools, diameter tape, isopropyl and isopropyl wipes; fittings include – couplers, tees, elbows, under clamp saddles, top loading saddles.

- 2.2 Manual and semi-automatic input electrofusion control units are described in terms of components and their purpose, and the relative advantages and disadvantages of the machines are explained.
- Range power supply, control unit, adaptor pins, residual current devices, variable voltage.
- 2.3 Electrofusion jointing of polyethylene pipes is described in terms of test methods and their purpose, traceability requirements, reporting, and QA documentation requirements.
- 2.4 Factors that affect the quality of electrofusion joints are described in terms of their causes, effects, and appropriate corrective actions.
- Range environmental factors, non-environmental factors.
- 2.5 Jointing faults and their causes are identified and methods to avoid them are explained.
- Range contamination, pipe misalignment, ovality and pipe geometry, fusion pressure, influence of ambient temperature, fitting assembly, pipe peeling, lack of isopropyl flash-off, lack of restraint.

Outcome 3

Demonstrate knowledge of butt fusion jointing of polyethylene pipe for water networks.

Performance criteria

- 3.1 The process of butt fusion is described, and butt fusion jointing equipment is described in terms of function in the process.
- Range planing tool, pipe cutters and saws, debanding tools, rollers, shelters, clamps, heat plate, control unit.
- 3.2 Manual hydraulic and semi-automatic butt fusion jointing machines are described in terms of components and their purpose, and the relative advantages and disadvantages of the machines are explained.
- 3.3 Manual hydraulic and semi-automatic butt fusion jointing machines are described in terms of operator inputs for joint parameters, calibration requirements, and maintenance and storage requirements.
- 3.4 Butt fusion jointing of polyethylene pipes is described in terms of test methods and their purpose, traceability requirements, reporting, and quality assurance documentation.
- 3.5 Factors that affect the quality of butt fusion joints are described in terms of their causes, effects, and appropriate corrective actions.
- Range environmental factors, non-environmental factors.

3.6 Jointing faults and their causes are identified and methods to avoid them are explained.

Range pipe misalignment, cold weld, hot weld, contamination, ovality, fusion pressure and time, influence of ambient temperature, fitting assembly.

Planned review date	31 December 2026
----------------------------	------------------

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	29 November 2018	31 December 2023
Review	2	26 August 2021	N/A

Consent and Moderation Requirements (CMR) reference	0101
--	------

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

Comments on this unit standard

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