Title	**Describe chemical mixing safety, and use chemicals for batch production in an energy and chemical plant**		
Level	**3**	**Credits**	**3**

Purpose	This unit standard is intended for boiler operators and energy and chemical process operators. People credited with this unit standard are able to: describe safety requirements for mixing chemicals in an energy and chemical plant; prepare to mix chemicals for batch production; mix and use chemicals for batch processing operations; and complete the batch; in an energy and chemical plant.

Classification	Energy and Chemical Plant > Operation of Energy and Chemical Plant

Available grade	Achieved

Guidance Information

1 Legislation relevant to this unit standard includes but is not limited to:
- Health and Safety at Work Act 2015;
- Health and Safety at Work (Hazardous Substances) Regulations 2017 (HSWA);
- Resource Management Act 1991;
  and any subsequent amendments.

2 Definitions
Energy or chemical plant may be in – petrochemical, agri-nutrient, power generation, dairy processing, meat processing, and wood fibre manufacturing, or other plants that operate with a combination of high temperatures, pressures, steam and/or chemicals in gas, liquid or solid form.
Organisational requirements – documented policies and procedures. These may include: equipment manufacturers' procedures, plant procedures, suppliers' instructions; site signage; codes of practice; company health and safety plans; on site briefings; and supervisor's instructions. This includes all regulatory and legislative obligations that apply to the plant.
Plant – the operational unit, equipment and/or workplace at which the person is working.
Hazchem data – the Hazchem emergency action code of numbers, letters, and diamonds that give information to emergency services. Its use is required by NZS 5433 PARTS 1 & 2:2012 *Transport of dangerous goods on land* available from https://www.nzta.govt.nz/driver-licences/getting-a-licence/licences-by-vehicle-type/transporting-dangerous-or-hazardous-goods/dangerous-goods-carried-by-transport-operators.

3 For the purposes of assessment:
- evidence for the practical components of this unit standard must be supplied from the workplace.
- evidence for all outcomes must be presented in accordance with organisational requirements.

Outcomes and performance criteria

Outcome 1

Describe safety requirements for mixing chemicals in an energy and chemical plant.

Performance criteria

1.1 Describe safety requirements in terms of chemical identification.

Range manufacturer's labels, safety data sheets, manuals, textbooks, Hazchem data.

1.2 Describe hazards and risks associated with the handling and mixing of chemicals.

1.3 Describe personal protective equipment used for handling the chemicals that are to be mixed in terms of their purpose.

Range aprons, face shields, goggles, gloves, chemical suits, breathing apparatus.

1.4 Describe safety requirements for neutralisation procedures.

1.5 Describe the potential results of mixing incompatible chemicals.

Range exothermic, endothermic, oxidation, corrosion, pyrophoric, atmospheric.

Outcome 2

Prepare to mix chemicals for batch production in an energy and chemical plant.

Performance criteria

2.1 Locate and use safety procedures for the mixing of chemicals.

2.2 Assemble documentation for guidance and recording of the work area before the procedure commences.

2.3 Select and clean the area to be used to mix chemicals in accordance with the factors which could affect the materials, the batch operation, and any risks or hazards associated with the procedure.

2.4 Prepare related services for operation prior to the work beginning.

Range ventilation, steam.

2.5 Confirm the equipment selected is suitable for mixing chemicals, and confirm as being clean and in safe and effective working order.

2.6 Identify and select chemicals in sufficient quantities for the mix of the batch.

Outcome 3

Mix and use chemicals for batch processing operations in an energy and chemical plant.

Performance criteria

3.1 Measure out chemicals for the batch, place in suitable containers, and label legibly with product and quantity.

3.2 Check chemicals for verification.

3.3 Carry out batch processing of chemicals.

3.4 Take actions to eliminate or minimise hazards and loss of materials during batch processing operations.

3.5 Complete documentation for the chemical and/or batch at the time of manufacture.

3.6 Maintain records of all adjustments and any abnormalities during chemical use.

Outcome 4

Complete the batch in an energy and chemical plant.

Performance criteria

4.1 Quantify and record amounts of final product and unused chemicals.

4.2 Transfer the product to storage in containers with correct labelling.

4.3 Dismantle and store equipment.

Range cleaned, decontaminated, packed, labelled.

4.4 Store materials in containers which are accurately labelled to indicate content.

4.5 Store waste from the batch in containers or areas designated for disposal purposes.

4.6 Decontaminate and clean the area to remove all residues.

4.7 Complete and report documentation.

Replacement information	This unit standard was replaced by skill standard 40390.

This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	6 February 1997	31 December 2018
Revision	2	3 August 2000	31 December 2018
Review	3	24 January 2002	31 December 2018
Review	4	20 February 2009	31 December 2018
Rollover and Revision	5	20 April 2017	31 December 2024
Review	6	27 February 2020	31 December 2026
Review	7	27 March 2025	31 December 2026

Consent and Moderation Requirements (CMR) reference	0079

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