

Title	Manufacture ANFO explosives		
Level	4	Credits	10

Purpose	People credited with this unit standard are able to: select ingredients to manufacture ANFO; check the working order of the ANFO mixing equipment; mix ANFO ingredients; and carry out ANFO post-mixing procedures.
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Classification	Extractive Industries > Extractive Industries Management
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Available grade	Achieved
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Prerequisites	Unit 16687, <i>Demonstrate knowledge of hazardous substances at an extractive site</i> , or demonstrate equivalent knowledge and skills.
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Guidance Information

- 1 The ingredients for the manufacture of ANFO are referred to as ingredient one (the solid) and ingredient two (the liquid), and dye. This is for security reasons.
- 2 Performance of the outcomes of this unit standard must comply with the following:
 - Hazardous Substances and New Organisms Act 1996 (HSNO);
 - Resource Management Act (RMA) 1991;
 - Health and Safety at Work Act 2015 (HSW);
 - Health and Safety at Work (General Risk and Workplace Management) Regulations 2016;
 - Health and Safety at Work (Worker Engagement, Participation, and Representation) Regulations 2016;
 - Health and Safety at Work (Mining Operations and Quarrying Operations) Regulations 2016;
 - Safety Data Sheets.
- 3 To manufacture ANFO on site, the company involved must be issued with the appropriate licence under the HSNO. This licence may also be influenced by the RMA. It is the responsibility of the trainer and trainee involved in this unit standard to ensure that licence has been issued and is current.
- 4 As a licence holder, the company is required to maintain a written record of its procedures. These procedures must be to a standard no less than the laws and regulations governing the safe manufacture and handling of explosives in New Zealand and must meet the requirements, if any, of the RMA. This procedural document must be available to the trainer and trainee.

- 5 In relation to mixing equipment, checks and specifications for the following items must be noted. In checking the equipment, the bearings of the mixer must be checked. The electric motor must be of IP5 rating only. The mixer including the auger must be made of stainless steel. Mild steel augers are not permitted.
- 6 Personal protective equipment must be used or worn at all times.
- 7 **Definitions**
Industry best practice refers to those practices which competent practitioners within the industry recognise as current industry best practice. These may be documented in management plans, industry best practice or requirements, managers' rules, occupational health and safety policy, industry guidelines, codes of practice, manufacturers' instructions, safe working and/or job procedures (or equivalent).
Safety Data Sheet is an informational document provided by the manufacturer regarding the safety and handling procedures and precautions for materials used in the workplace.

Outcomes and performance criteria

Outcome 1

Select ingredients to manufacture ANFO.

Performance criteria

- 1.1 Ingredient one is selected in the quantity and quality required for the planned shotfiring.
- 1.2 Ingredient two is selected in the quantity required in proportion to the amount of ingredient one selected.
- 1.3 Oil soluble dye is selected in sufficient quantity to enable a distinct colour change to occur when added to the mixture in accordance with industry best practice.
- 1.4 Selected ingredients and dye are documented in accordance with industry best practice.
- 1.5 Safety clothing is selected and worn in accordance with industry best practice.

Outcome 2

Check the working order of the ANFO mixing equipment.

Performance criteria

- 2.1 Ingredient two system is checked for leaks and contamination in accordance with industry best practice.

Range filters and/or lines and/or valves and/or containers.

2.2 Mixing equipment is checked for worthiness in accordance with industry best practice.

Range earth straps and/or isolation of energy source and cleanliness.

2.3 Sieves, strainers and filters are checked as intact and in place where a mechanical mixing system is used, in accordance with the HSNO Act and relevant Regulations.

Outcome 3

Mix ANFO ingredients.

Performance criteria

3.1 The percentage of ingredient one and ingredient two of the final mix is checked with a licenced explosives manufacturer as suitable to maintain end product quality in relation to the explosive task to be undertaken.

3.2 Calibration checks for ingredients one and two containers are conducted in accordance with industry best practice.

3.3 The mix is carried out in accordance with industry best practice.

Range mix is to time and/or visual colouration.

3.4 Mixture is placed in a container suited to the end use in accordance with industry best practice.

3.5 The mixture is readied for end usage in accordance with industry best practice.

Range delivery and/or storage in accordance with the HSNO Act.

Outcome 4

Carry out ANFO post-mixing procedures.

Performance criteria

4.1 Spillage is collected and disposed of in accordance with industry best practice and the RMA where applicable.

4.2 Unused ingredients are returned to secure storage area in accordance with industry best practice.

4.3 Equipment is cleaned to a 'ready for use' state in accordance with industry best practice.

4.4 Documentation is completed in accordance with industry best practice.

4.5 Safety equipment and clothing is returned to its dedicated storage area in a 'ready for use' state in accordance with industry best practice.

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	30 July 1998	31 December 2019
Review	2	19 April 2002	31 December 2019
Review	3	21 August 2009	31 December 2027
Rollover and Revision	4	25 January 2018	31 December 2027
Review	5	27 November 2025	31 December 2027

Consent and Moderation Requirements (CMR) reference	0114
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.