



Australian Government

PUAFIR214 Use Class A foam in wildfire operations and non-structural applications

Release 2

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Modification History

Release	TP Version	Comments
2	PUA12 V2.1	Editorial changes.
1	PUA12 V2	New unit.

Unit Descriptor

This unit covers the competency required to use Class A foam to extinguish Class A carbonaceous solid fires in wildfire operations, secure against ignition or extinguish Class B shallow hydrocarbon fuel spills, and to operate and maintain the foam equipment required for its production.

Class A foam is a liquid foam solution used mostly to extinguish fires in ordinary combustible solids such as wood, fabric, paper or organic material. The foam blanket adheres to fuels and gradually releases the water in the foam to wet fuels for a longer period than water alone.

Class B shallow hydrocarbon fuel spills include incidents such as at road crash scenes where fuel tanks may have been ruptured or leaking, service station fuel pump area spills or machinery refuelling trailers.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Application of the Unit

This unit applies to personnel on the fireground responsible for preparing, handling and applying Class A foam during wildfire and non-structural firefighting operations.

Compliance with environmental and work health and safety work practices is required.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

PUAFIR204B Respond to wildfire

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a Unit of Competency.

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Where ***bold italicised*** text is used, further information is detailed in the Range Statement. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT

PERFORMANCE CRITERIA

1. Prepare Class A foam for use

- 1.1 ***Type of foam for application in a wildfire*** or on ***non-structural objects*** is selected depending on the required effect of the foam on the components of the fire triangle and the fuel
- 1.2 Decision to apply ***Class A foam to Class A fuels*** at wildfire or non-structural incident is received from Incident Controller
- 1.3 ***Foam proportioning or induction rate*** is selected in accordance with manufacturer's recommendations or organisational guidelines to produce the solution strength required to achieve the operational objective and decision is communicated to crew preparing the foam
- 1.4 ***Foam expansion or aspiration ratio*** is confirmed based on fuel type, operational requirements and the need to achieve ***maximum operational benefit***
- 1.5 Class A foam concentrate and equipment are prepared for use in accordance with ***safe work practices*** and in consideration of the ***potential environmental impact*** and ***required precautions to be complied with***
- 1.6 Correct ***personal protective clothing and equipment*** required for working with Class A foam is donned for handling concentrate and for handling solution.

2. Operate Class A foam system and equipment

- 2.1 Type of ***Class A foam system*** is confirmed
- 2.2 Predetermined required amount of foam concentrate is added to the water flow using the appropriate equipment as directed by the Incident Controller
- 2.3 Foam system available on the tanker or appliance is operated using predetermined proportioning or

induction method

2.4 Where system is manually regulated, proportioning percentage rate and flow are monitored and achievement of required operational objective is confirmed

3. Apply Class A foam

3.1 Foam system and equipment on the tanker or appliance is operated to produce the required solution strength suitable for its *intended application* as non aspirated or aspirated foam and for the type of fuel to which it is to be applied

3.2 Class A foam is *applied* as a *direct attack* to extinguish the edge of the fire using non aspirated or low expansion foam nozzles and the environmental impact of this application is minimised

3.3 Class A foam is used to wet fuels to *construct a control line* adjacent to the fire edge using required foam proportion rate to contribute to fuel reduction burning, burning out and back burning

3.4 Foam is applied to conduct *mop-up/blacking out operations* by regulating the flow to suit the required application type and rate

3.5 Class A foam is applied to *non-structural objects* in accordance with organisational standard operating procedures for these types of fires

3.6 Direct and indirect application of Class A foam are demonstrated in accordance with organisational operating procedures

3.7 Potential for crop contamination as a result of application of Class A foam in *organic and certified properties* is taken into consideration and the environmental impact and appropriate *preventative measures* are implemented where practicable

4. Store and handle Class A foam and prevent damage to equipment and the environment

4.1 Class A foam is stored on tankers and appliances in the designated storage drum, rack or tank provided

4.2 *Storage arrangements* in workplace and other locations for Class A drum stocks of foam concentrate are adhered to

4.3 *Measures to control leaks or spills* are followed in accordance with organisational procedures

4.4 Class A foam tanks are refilled or topped up using appropriate personal protective clothing and equipment, and approved foam concentrate transfer equipment in accordance with organisational procedures and environmental requirements

4.5 Cleaning and safe disposal of any foam spills is

undertaken in accordance with relevant safety data sheets (SDSs)

- 4.6 Foam compatibility is taken into account when using Class A foam solution from different vehicles on the same fire, when mixing one manufacturer's brand of Class A foam with another
- 4.7 Environmental regulations as specified in organisational procedures are adhered to when using foam and cleaning spills or foam equipment around the workplace
- 4.8 Procedures for foam storage, mixing and filling sites are implemented in accordance with appropriate guidelines
- 4.9 Practices that do not contaminate water bodies, storm water drains or agricultural areas are adhered to when cleaning equipment at an incident or other location where Class A foam is used

Required Skills and Knowledge

This describes the essential skills and knowledge and their level, required for this unit.

Required Skills

- calculate proportioning or induction rates
- flush the foam system
- indirectly apply medium expansion foam plumbing lay out
- operate Class A foam system
- select and operate branch nozzle to create a jet stream or fog pattern
- top up and refill replacement of drums

Required Knowledge

- application of Class A foam:
- circumstances in which it can be used
- direct application of low expansion foam
- indirect application of low expansion foam
- benefits of using Class A foam
- class A foam system types and their operating components
- classes of fire
- components of the Class A foam system
- concentrate
- density
- effects of Class A foam on the fire triangle
- environmental impacts of Class A foams and precautions
- equipment cleaning
- expansion
- flame, heat and burn back
- foam application methods
- foam concentrate storage and handling
- foam expansion or aspiration
- foam expansion ratio
- foam proportioning or induction rates
- foam storage, mixing and filling sites
- foam types and their use for wildfire application
- foam types for non-structural applications and reason for restricting the use of Class A foam on structures
- fuel pick up
- ghosting
- personal protective clothing and equipment
- properties of Class A foam
- proportioning rate versus foam type versus drain time
- solution

- surface tension
- safe work practices
- use of Class A foam on Class B hydrocarbon fuels (flammable liquids such as petrol, diesel and fuel oils) and their impact

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

Assessment must confirm the ability to:

- apply Class A foam on a range of fuels using nominated proportioning or induction rates
- select the correct foam proportioning rate and foam expansion or aspiration ratio for the fuel to be treated
- implement the procedures for operating and flushing the Class A foam system and minimising the risk of equipment or environmental contamination
- implement safe work practices and environmental precautions when working with Class A foam

Consistency in performance

Competency should be demonstrated over time in either an operational environment, an industry-approved simulated workplace environment, or both.

Context of and specific resources for assessment

Context of assessment

Competency should be assessed in an agency approved simulated and/or workplace environment.

Specific resources for assessment

Access is required to:

- pumper or tanker fitted with a Class A foam system and associated equipment
- training site where activity can be undertaken with minimum impact to the environment

Method of assessment

In a public safety environment assessment is usually conducted via direct observation in a training environment or in the workplace via subject matter supervision and/or mentoring, which is typically recorded in a competency workbook.

Assessment is completed using appropriately qualified assessors who select the most appropriate method of assessment.

Assessment may occur in an operational environment or in an agency-approved simulated work environment. Forms of assessment that are typically used include:

- direct observation

- interviewing the candidate
- journals and workplace documentation
- third party reports from supervisors
- written or oral questions

Range Statement

<p>The Range Statement relates to the Unit of Competency as a whole. It allows for different work environments and situations that may affect performance. <i>Bold italicised</i> wording in the Performance Criteria is detailed below.</p>	
<p><i>Type of foam</i> may include:</p>	<ul style="list-style-type: none"> • dry • fluid • solution • wet
<p><i>Application in a wildfire</i> may include:</p>	<ul style="list-style-type: none"> • asset protection • blacking out • control line construction • direct attack • mop-up
<p><i>Non-structural objects</i> may include:</p>	<ul style="list-style-type: none"> • coal fires • hydrocarbon fuels • machinery fires (dozers, graders) • motor vehicles • small and shallow hydrocarbon fuel spills • tyre dumps
<p><i>Class A foam</i> includes:</p>	<ul style="list-style-type: none"> • Combination of synthetic detergent surfactants that reduce the surface tension of water • Foaming agents, corrosion inhibitors that reduce corrosion of metals and preservative to prolong shelf life
<p><i>Class A fuels</i> are:</p>	<ul style="list-style-type: none"> • flammable solids including: • forest flammable and grassland fuels • wood • paper • plastics and rubber
<p><i>Foam proportioning or induction rate</i> may include:</p>	<ul style="list-style-type: none"> • production of foam with properties within effective range • use of foam chemicals at safe concentrations
<p><i>Foam expansion or aspiration ratio</i> may include:</p>	<ul style="list-style-type: none"> • low expansion foam • high expansion foam • medium expansion foam • non-aspirated foam
<p><i>Maximum operational benefits</i> may include:</p>	<ul style="list-style-type: none"> • application visible from ground and air • easily proportioned • effective for use on all Class A fuel • extension of the useful life of water

	<ul style="list-style-type: none"> • increase in the effectiveness of water • reduction in suppression and mop-up time • short-term fire barrier • simple application
<i>Safe work practices</i> must include:	<ul style="list-style-type: none"> • avoiding contamination from exposure • being alert to concentrate and solution as it contributes to creating slippery conditions on vehicle decks and on the ground • being alert to the presence of trip hazards, holes and hot ash beds can be concealed beneath the foam blanket
<i>Potential environmental impact</i> of use of Class A foam may include:	<ul style="list-style-type: none"> • adverse impact on aquatic systems such as swamps, dams, waterways, particularly where water flow rates are low • adverse impact of synthetic chemicals on organic and certified properties • breaching of environmental regulations at fire stations and other foam and mixing storage sites by: • releasing foam into drains, waterways and aquatic systems • affecting the performance of interceptors by inhibiting the separation of fuels and oils contained in interceptor pits • plastic foam containers taking up valuable landfill space and contamination of the contents
<i>Required precautions to be complied with</i> when using Class A foam may include:	<ul style="list-style-type: none"> • avoiding the use of foam 50 metres from waterways • conducting foam training at a location away from waterways, storm water drains or agricultural areas • containing and disposing of, where practicable, fire-water run-off containing Class A foam or wetting agent prior to its use • minimising the use of foam and wetting agent • notifying and seeking advice from the environment protection authority if there is substantial or significantly polluted fire-water run-off or where Class A foam or wetting agent enters a waterway • where Class A foam or wetting agent enters a domestic water storage, flushing the water storage before re-use • where possible, using alternatives to foam and wetting agent to suppress fires where there is a risk of contaminating waterways
<i>Personal protective clothing and equipment</i> required for	<ul style="list-style-type: none"> • in all situations • rubber or leather boots

working with Class A foam may include:	<ul style="list-style-type: none"> • safety goggles • wildfire or structural helmet • wildfire overalls or structural firefighter clothing as appropriate for specialist use applications • in addition, when handling concentrate • handling nitrile or neoprene gloves • p2 nuisance level organic vapour respirator (non cartridge type) • in addition, when handling solution • barrier cream for hands • leather gloves
<i>Class A foam system</i> may include:	<ul style="list-style-type: none"> • low energy • high energy
<i>Intended application</i> of non aspirated foam includes:	<ul style="list-style-type: none"> • cools • isolates • penetrates
<i>Intended application</i> of aspirated foam includes:	<ul style="list-style-type: none"> • cools • isolates • insulates • penetrates • smothers
<i>Applying Class A foam</i> may include:	<ul style="list-style-type: none"> • direct application • indirect application
<i>Direct attack</i> includes:	<ul style="list-style-type: none"> • constructing a control line immediately adjacent to the fire edge • directly extinguishing the fire's edge using water, foam, earth or by beating out the flames
<i>Constructing a control line</i> includes:	<ul style="list-style-type: none"> • using a natural or constructed barrier or treated fire edge to limit the spread of fire
<i>Mop-up/blacking out operations</i> include:	<ul style="list-style-type: none"> • making a fire safe after it has been controlled by extinguishing or removing burning material along or near the control line, felling stags, trenching logs to prevent rolling and the like
<i>Non-structural objects</i> may include:	<ul style="list-style-type: none"> • coal conveyor belts • power station cable ducts • ships holds • underground mining • vehicles
<i>Organic and certified properties</i> may include:	<ul style="list-style-type: none"> • properties that meet the requirements of national standards such as the national standard for organic

	and bio-dynamic produce (NSOBDP) 2002
<i>Preventative measures when using Class A foam on organic or certified properties</i> may include:	<ul style="list-style-type: none"> • wherever practicable, using alternatives to foam and wetting agent to suppress fires on organic or certified properties • alerting organic and certified property owner/occupier to potential issues that may arise as a result of the contamination from Class A foam or wetting agent • confirming properties in the local area that are organic or certified • installing signage at all access points to a property, identifying it as organic or certified
<i>Storage arrangements</i> in workplaces may include:	<ul style="list-style-type: none"> • storing foam to minimise the risk of foam entering drains • locating foam mixing and loading areas away from waterways
<i>Measures to control leaks or spills</i> may include:	<ul style="list-style-type: none"> • bunding stockpiles of Class A foam concentrate where there is a risk of spilled concentrate entering drains or waterways • bunding with the capacity to contain the contents of 2–3 containers • exercising care to avoid spills at mixing and loading areas • avoiding contamination of interceptor pits with foam or wetting agent • cleaning and safely disposing of any foam spills in accordance with the SDS

Unit Sector(s)

Not applicable.

Custom Content Section

Not applicable.