

PORTABLE FIRE EXTINGUISHERS FOR LITHIUM-ION BATTERY FIRES

A fire safety guideline for the use of
portable fire extinguishers for lithium-
ion battery fires

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1. Introduction

This guideline is developed pursuant of Section 10(4) of the *Fire Service Act 1979* (Tasmania) to outline the position of the Tasmania Fire Service (TFS) on the suitability of portable fire extinguishers for use on lithium-ion battery fires.

This guideline is to provide technical advice and guidance to:

- a. Building owners and occupiers
- b. Building industry professionals including designers and fire engineers
- c. Fire industry professionals including fire equipment installers
- d. Manufacturers and retailers

Lithium-ion batteries are widely used in commercial and residential sectors and are made in different forms and sizes where the manufacturing of these batteries is continually changing. Generally, they are safe, however if they are mistreated, damaged, have manufacturing defects are incorrectly used or have charging issues they may be prone to fires.

In Australia, there have been several instances where lithium-ion battery fires have caused considerable damage to buildings.

The Australasian Fire and Emergency Services Authorities Council (AFAC) has produced 2 publications related to lithium-ion safety:

1. [Advisory note](#) on 'Fire extinguishers and fire blankets marketed for lithium-ion battery fires'.
2. [Community safety messages and considerations for lithium-ion batteries](#)

TFS has produced a '[Home Fire Safety Fact Sheet](#)' with Lithium-ion battery fire safety tips.

2. Standards for portable fire extinguishers

Within Australia all portable non-aerosol fire extinguishers must comply, by law with the mandatory standard, the [Consumer Goods \(Portable Non-aerosol Fire Extinguishers\) Safety Standard 2021](#) that sets out requirements for portable non-aerosol fire extinguishers.

This mandatory standard applies to fire extinguishers that contain chemicals which can be discharged in a rapid stream to extinguish different types of small fires. These chemicals include:

- Water
- Wet-chemical
- Foam or powder
- Carbon Dioxide

Portable fire extinguishers can be rechargeable or non-rechargeable. The mandatory standard prescribes requirements for cylinder construction, performance testing and identification colours.

The mandatory standard is based on certain sections of the voluntary Australian New Zealand standard AS/NZS 1841.1-2007 Portable fire extinguishers. Additionally, performance tests are carried out in line with AS/NZS 1850-2009.

3. Portable fire extinguishers for lithium-ion battery fires

The TFS are aware of fire extinguishers that are being used in Australia that indicate they can be used specifically for lithium-ion battery fires. Under current AS/NZS 1850-2009 there is no fire test for the assessment of the suitability of portable fire extinguishers for lithium-ion battery fires.

A great deal of caution should be exercised in the use of unrated portable fire extinguishers, especially as they do not hold an 'E' class rating for use on electrical fires.

TFS recommend that a broader assessment be undertaken of the exposures within the environment containing the lithium-ion batteries and a suitable portable fire extinguisher be installed to deal with those exposures if practical to do so.

TFS does not recommend the use of portable fire extinguishers specifically for lithium-ion battery fires that do not carry the Australian Standard Certification mark or are certified in writing by the Joint Accreditation System of Australia and New Zealand (JAS-ANZ).

The CSIRO have issued [Advisory Note AN-004](#) that provides important information for the evaluation and verification of evidence of conformity for the extinguishment of Lithium-ion batteries under the CSIRO Verification Services' ActivFire® Scheme. No Australian Standard has been published to provide performance requirements for the extinguishment of fires related to Lithium-ion batteries. Accordingly, CSIRO Verification Services' ActivFire® Scheme has advised its stakeholders that it has not and will not certify, and thus provide a Certificate of Conformity, that any fire extinguisher can effectively extinguish a Lithium-ion battery fire.

4. The selection and location of portable fire extinguishers

AS 2444 *Portable fire extinguishers and fire blankets – Selection and location*, is adopted and reference by the Building Code of Australia, it is applied to select and install the appropriately rated extinguisher for a particular class of fire.

Currently AS 2444 does not specify a preferred extinguishing agent for fire risks associated with lithium-ion batteries. Appendix B of AS 2444 specifies the appropriate extinguishing agent for specific risks.

AS 2444 states: Fire extinguishers complying with Australian Standards are marked with a fire classification and rating, determined in accordance with AS/NZS 1850, which indicates the class and size of fire for which they have been successfully tested. An extinguisher shall be selected for its capability for use on the fire risk that is to be protected.

5. Supply

The mandatory safety standard applies to all new portable non-aerosol fire extinguishers. It does not apply to second-hand portable non-aerosol fire extinguishers unless:

- the fire extinguisher has been imported into Australia; and
- the fire extinguisher is being supplied, or offered for supply, to a person or persons within Australia for the first time after being imported.

Note: The Fire Protection Association (FPA) Australia have proposed a project to Standards Australia to address lithium-ion battery fire risks with a revision of the following standards:

- Revision, AS/NZS 1841.1:2007, Portable fire extinguishers, Part 1: General requirements.
- Revision, AS/NZS 1850:2009, Portable fire extinguishers - Classification, rating and performance testing.
- Revision, AS 2444-2001, Portable fire extinguishers and fire blankets - Selection and location.

6. References

Australasian Fire and Emergency Services Authorities Council. (2024) *Community Safety Messages and Considerations for Lithium-ion Batteries and Emerging Energy Risks* (AFAC Publication No. 3100). AFAC, Melbourne, Australia.

Australasian Fire and Emergency Services Authorities Council. (2024) *Advisory note: Fire extinguishers and fire blankets marketed for lithium-ion battery fires*, AFAC, Melbourne, Australia.

Australian Competition & Consumer Commission, Portable non-aerosol fire extinguishers, Supply, available at [Portable non-aerosol fire extinguishers](#) | Product Safety Australia.

Commonwealth Scientific and Industrial Research Organisation (CSIRO), [Advisory Note AN-004](#), Extinguishment of Li-Ion Battery Fires, Issued 30 November 2023.

[Consumer Goods \(Portable Non-aerosol Fire Extinguishers\) Safety Standard 2021](#)

Standards Australia, (2001), *Portable fire extinguishers and fire blankets - Selection & location*, AS 2444: 2001.

Standards Australia, (2007), *Portable fire extinguishers series*, AS/NZS 1841:2007

Standards Australia, (2009), *Portable fire extinguishers - Classification, rating and performance testing*, AS/NZS 1850:2009.

Standards Australia, (2012), *Routine service of fire protection systems and equipment* AS 1851: 2012.



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