



## FIRE PUMP BATTERIES

Fortifire is committed to helping our customers in being compliant, clean, green and sustainable. This fact sheet provides information to assist Fortifire technicians and property owners and their representatives to better understand their responsibilities and comply with Queensland Building Fire Safety Regulation and QDC MP6.1.

View our website [www.fortifire.com.au](http://www.fortifire.com.au) for videos and other information.

## What are Fire Pumps

Fire pumps in Australia, as in many other countries, are a critical component of fire protection systems. These pumps are designed to provide a reliable and sufficient water supply for firefighting efforts, especially in areas where the water pressure from the mains may not be adequate or where an independent water source is needed.



## Requirements for Fire Pump Batteries

In Australia, the installation and operation of fire pumps are regulated by various standards and codes which provides guidelines for the design, installation, and maintenance of fire pump systems.

The Australian National Construction Code specifies the requirement for Fire Pumps to be installed in accordance with the following Australian Standards:

- AS 2118.1-1999: Automatic fire sprinkler systems – General systems
- AS 2118.4-1995: Automatic fire sprinkler systems – Residential
- AS 2118.6-1995: Automatic fire sprinkler systems – Combined sprinkler and hydrant
- AS 2419.1-2005: Fire hydrant installations – System design, installation, and commissioning

All of these standards stipulate that fire compression-ignition (diesel) pump sets associated with these systems must be installed as per Australian Standard 2941 for Fixed Fire Protection Installations – Pumpset Systems.

Australian Standard 2941 specifies the requirements for batteries for Fire Pumpsets and this information is detailed in Australian Standard 4029 Parts 1, 2 and 3:

- AS 4029.1-1994, Stationary batteries – Lead-acid – Vented type
- AS 4029.2-2000, Stationary batteries – Lead-acid – Valve-regulated type
- AS 4029.3-1993, Stationary batteries – Lead-acid – Pure lead positive pasted plate type

## How to Choose a Suitable Battery

Historically, there have been incidents within the fire industry where inappropriate batteries have been used resulting in failure to operate and safety incidents where batteries have ruptured or exploded.

As such, it is Fortifire's Policy to only install batteries for fire equipment that have a current approval listing on the CSIRO ActivFire Register

<https://activfire.csiro.au/> .



ActivFire is a CSIRO SSL (Scientific Service Laboratory) joint Government and industry body.

The CSIRO organization conducts testing on fire protection equipment, which includes batteries, to ensure compliance with applicable standards and specifications.

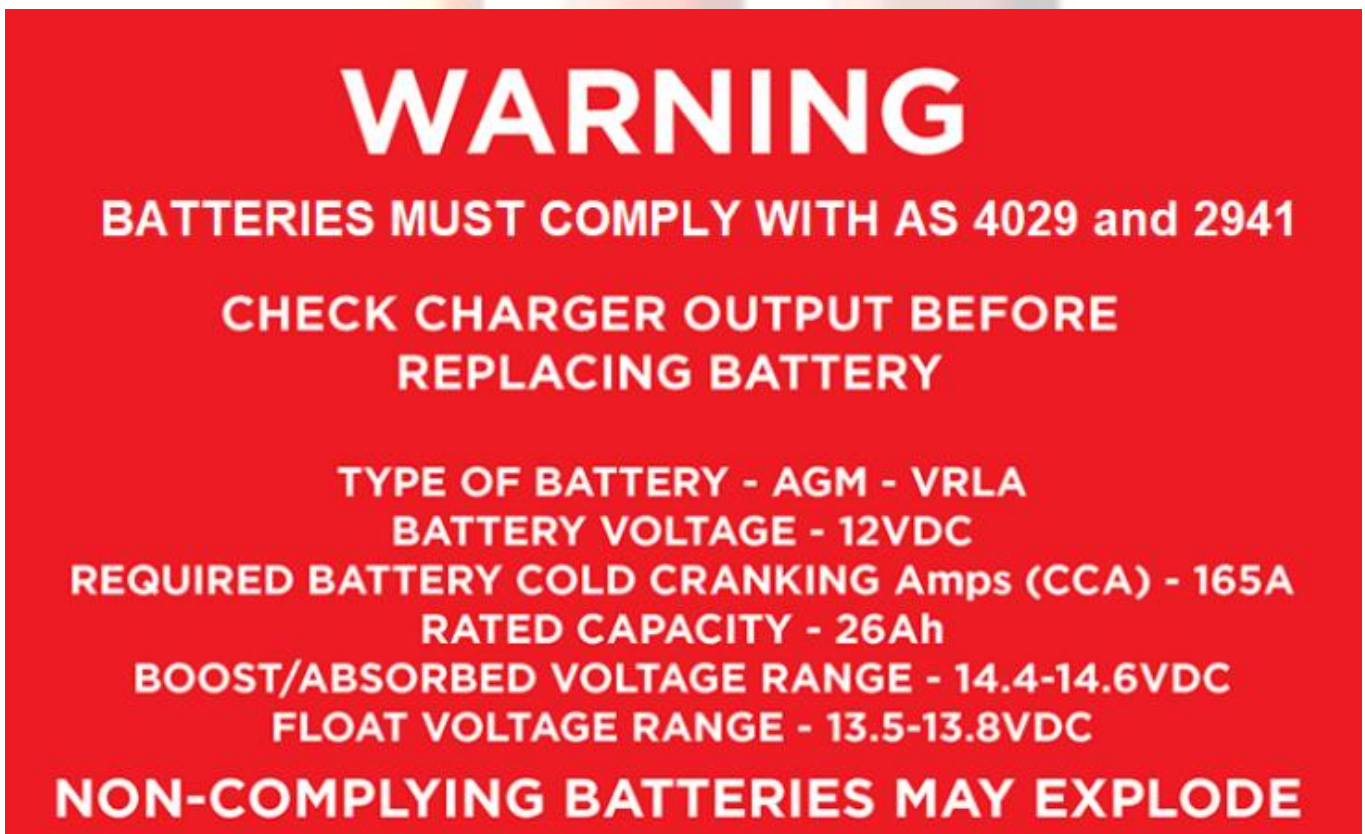
The ActivFire program maintains a register of fire protection equipment that has been confirmed to meet Australian Standards, international standards, and technical specifications. This register, identified as the Register of Fire Protection Equipment, is accessible on the website. A sample Certificate is shown below.

For peace of mind, it is advisable to exclusively use batteries that adhere to the ActivFire standards.

Where customers elect to use non-listed batteries, Fortifire will require a declaration and documented evidence that verifies the batteries satisfy the requirements of AS 4029 and the pump manufacturer.

Batteries must be compliant with AS4029.2 which means they are a fully sealed VRLA (Valve Regulated Lead Acid) maintenance-free Battery. This excludes the use of a traditional wet-cell unsealed battery type that can be topped up by electrolytes.

Battery identification plates are required to be attached to the system or enclosure including information such as; the voltage, CCA, Rated Capacity at C/20, Boost charge voltage, float charge voltage. This information is obtained from the Baseline Data and Manufacturers Specifications for the Fire Pump Engine and/or Controller.



*Sample Fortifire Battery Warning Sticker*

**IMPORTANT NOTE: Where Manufacturers Data is no longer available, determining the correct CCA rating for a battery must take into consideration a range of factors including engine size connected loads and ambient temperature.**

## Safety Benefits of AGM Batteries

According to Australian standards, a fire pump must be equipped with an AGM battery. B

AGM stands for Absorbent Glass Mat. In the context of batteries, AGM refers to the material positioned between the lead plates inside the battery, effectively suspending the acid.

When AGM batteries are employed in cranking applications, they are often labelled as deep cycle batteries. The term "deep cycle" indicates the battery's capability to undergo repetitive discharge.

AGM batteries, also known as sealed batteries, live up to their name by being sealed against spillage or electrolyte loss when handled correctly. Despite their sealed nature, AGM batteries incorporate valves, specifically VRLA (Valve Regulated Lead Acid). This design ensures that internally, the acid is immobilized, and any generated gases are recombined. In the event of excess pressure, the valve allows for the controlled release of gases.

Although sealed batteries like AGM are generally considered safe for operation in enclosed spaces, their low-pressure venting feature may still permit the escape of some gas under particular conditions.

## Confusion over terms "Deep Cycle" and "Cold Cranking Amps"

With respect to lead acid batteries, we are often asked what does Deep Cycle refer to?

Deep Cycle and Cold Cranking Amps (CCA) are terms associated with lead-acid batteries, specifically automotive and marine batteries. These terms describe different aspects of a battery's performance and suitability for specific applications. Some manufacturers refer to their batteries that are suitable for Fire Pumpsets as being "Deep Cycle".

### Deep Cycle:

Definition: Deep cycle refers to a battery's ability to be discharged and recharged repeatedly over an extended period.

Application: Deep cycle batteries are designed to provide a steady amount of current over a long duration, making them well-suited for applications that require sustained power over an extended period, such as fire pumpsets, marine and RV (recreational vehicle) applications, golf carts, solar power systems, and electric vehicles.

### Cold Cranking Amps (CCA):

Definition: CCA is a measure of a battery's ability to deliver a high amount of current at cold temperatures, typically at 0°F or -18°C, for a short duration without failure.

Application: CCA is crucial for starting a motor in cold weather. When the temperature drops, the chemical reactions within a battery slow down, reducing its ability to provide power. The CCA rating ensures that the battery can still deliver enough power to start the engine even in cold conditions.

In summary, deep cycle batteries are designed for applications where a steady, sustained power output over a longer period is required, while CCA is a measure of a battery's ability to start an engine in cold temperatures by delivering a burst of power. Some batteries are designed to excel in both deep cycle and cold cranking applications, offering a balance of features for versatile use. It's important to choose the right type of battery based on the specific requirements of the application.

# Electric and Diesel Fire Pumpsets

## Electric Fire Pumpset

Standby Batteries are incorporated into an electric fire pumpset controller panel to ensure the continued operation of the pump controller panel and activation of the "mains power fail" alarm signal during a mains power failure. When installing batteries for an electric fire pumpset, it is imperative to use a suitable "standby battery." The battery will not be capable of running the pump – it is for the controller panel only.

## Diesel Fire Pumpset

For diesel fire pumpsets, modern pumps are fitted with a dual set of batteries (Primary and Secondary in 12 v or 24v configurations). The two sets of batteries typically operate as the motor start battery and the standby battery. In the event that the primary start batteries fail, the secondary (backup) batteries are engaged.

## Are we talking START battery or CONTROL battery?

For electric and compression ignition (diesel) fire pumpsets, there can be two (2) types of batteries.

- Engine Start Batteries - batteries with more grunt to start an engine repeatedly if necessary
- Control Batteries - typically think stand-by performance for the Pump Controllers

### Fire Pumpset - Engine Start Batteries

An engine start battery is used for the rapid release of current (measured in Ampere) which is necessary for motor start applications. An engine start battery will have a capacity rating measured in Cold Cranking Amps (CCA).

In practical terms, a higher CCA rating means the battery has more starting power and is better equipped to start an engine in colder temperatures.

### Fire Pumpset - Control Batteries

Control Batteries are used in both electric and diesel fire pumpsets. They are a stationary battery designed to supply energy for operating the pump controller of a fire pumpset. This is especially important in the event that 240v power is lost to the property.

### Dual Purpose Engine Start and Control Batteries

It is more common for modern fire pumpsets to be equipped with batteries which are generally configured with a primary and secondary battery arrangement. Both batteries (engine start and control batteries) will be capable of performing the engine start function. As such, both batteries must meet Engine Start Performance requirements including the correct Cold Cranking Amps (CCA) rating.



## When are fire pumpset batteries replaced?

The Australian Standard 1851:2012 is clear on the requirements for testing and replacing batteries and is mandated in Queensland by the Queensland Development Code MP6.1 and the Building Fire Safety Regulation 2008.

Refer below to extracts (shown in *Italics*) from AS1851:2012 Table 3.4.3 which specifies the criteria for replacement and testing of batteries in fire pumpsets:

**Engine start batteries** *REPLACE all engine-starting batteries after a maximum of 2 years service, irrespective of condition. Record date of replacement on the new battery and the date the batteries were replaced in the service record.*

Most modern fire pumps have a primary battery (12v systems) or two batteries (2x 12v batteries in series - 24v system) for engine start applications.

They will also typically have secondary (backup) batteries that in their normal condition will serve as the control batteries but in an emergency situation may also be used as an engine start battery.

In this case all batteries MUST be replaced every two years irrespective of condition.

**Control batteries** *When the battery has not been replaced in the previous two years, verify the battery condition by carrying out a battery discharge test in accordance with Appendix F of the Standard.*  
Engine Start Batteries

An electric fire pump controller will typically be fitted with a single battery (control battery) that is used as a stationary battery. Where the battery has not been replaced in the previous two years, a competent technician should carry out a battery discharge test in accordance with Appendix F of the Standard to verify its condition. Due to the expense and safety requirements associated with performing the required test, Fortifire will typically recommend the replacement of these batteries as a more economically viable solution.

## More information

For more information, feel free to contact Fortifire via email or phone or contact Fortifire to see how we can help.

Alternatively, contact your local Queensland Fire and Emergency Services representatives to seek their advice. They prefer building owners are proactive in these matters and will assist you to ensure your building is compliant.

<https://www.qfes.qld.gov.au/buildingsafety/Pages/default.aspx>

**NOTE: Fortifire provides a range of Fire Safety Equipment Testing and Certification Services that is automatically scheduled each year and we will also provide the required fire records.**

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