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## **Alcad 's Solar Range of Ni-Cd batteries offer optimum performance for renewable energy installations**

Alcad's new Solar Range of rechargeable nickel-cadmium (Ni-Cd) batteries has been developed to deliver totally reliable service and low maintenance for renewable energy installations. They provide the ideal, cost-effective alternative to VRLA (valve regulated lead acid) batteries in demanding applications worldwide including PV (photovoltaic) and stand-alone hybrid systems.

### **Complex charging conditions**

Alcad Solar batteries are designed to continue to operate at any state of charge, and reach a high state of charge without boost or reconditioning charges. This makes it easy to manage the complex charging patterns essential for efficient operation of the renewable energy system by avoiding the need to over-compensate for unpredictable charging conditions with high charging voltages.

Alcad Solar batteries are compatible with all current PV charge regulators and conventional industrial battery chargers. They have a typical charging voltage of 1.5 V per cell that minimises water consumption, eliminating unscheduled service calls.

### **Extreme temperatures**

A robust pocket plate construction and stable electrochemistry enables Alcad Solar to operate comfortably within a temperature range of  $-20^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$ , and they can tolerate extremes of  $-50^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$ . At extremely low temperatures capacity diminishes, but this is not permanent. For illustration, even at  $-40^{\circ}\text{C}$ , the batteries will deliver 80 percent capacity for a 120 hour discharge.

### **Long term low maintenance**

The Alcad Solar design features a robust pocket plate construction and shock-resistant polypropylene casing material. This enables it to withstand both physical abuse, such as during transport to a remote site, and electrical abuse. For example, Alcad Solar is completely unaffected by accidental overcharge (ie in the case of charge regulator failure) and deep discharge or inversion.

The alkaline electrolyte does not react with the nickel-plated steel components, so the structure of the battery stays intact and unchanged throughout its life. Alcad Solar therefore requires very low maintenance and, most importantly, it will provide totally reliable and predictable performance over a 20-year service lifetime. With no manpower or equipment expenses for battery replacement, troubleshooting or repair, minimal maintenance and reduced need to travel to remote installations, Alcad Solar will significantly lower the life cycle cost of both the batteries and the whole renewable energy system.

Increased reliability can also reduce demands on expensive diesel generators, which helps to further reduce overall system running costs.

#### **Four-year maintenance intervals**

Alcad Solar features an optimised electrode design, combined with Alcad's well proven internal gas recombination technology (in line with IEC 62 259). These design features provide improved behaviour under unstable charging conditions and significantly extend the intervals for topping-up with water – to more than four years, depending on the application – reducing operating costs to a minimum.

Alcad's water filling system is available for Solar range cells from 185 Ah upwards. It enables fast, automatic and accurate topping-up, further extending maintenance intervals.

#### **Operating where lead acid batteries cannot**

Nickel-cadmium technology is inherently safe and resistant to over-, under- and complete discharging. Even at temperatures below  $-20^{\circ}\text{C}$ , Alcad Solar continues to perform without risk of corrosion or sulphation when cycled at a low state of charge.

The Alkaline electrolyte will not freeze and remains stable during operation. In contrast, under similar conditions lead acid batteries suffer from plate degradation, shortened life and risk of 'sudden death' failure.

**Wide range of capacities**

Alcad Solar batteries are available in a range of nominal capacities from 45 Ah up to 1110 Ah and are delivered ready filled and charged. They are fully recyclable and Alcad provides a service to collect and dispose of all its batteries at the end of their service life.

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