

20 Year-Life Lead-acid Battery for Renewable Energy

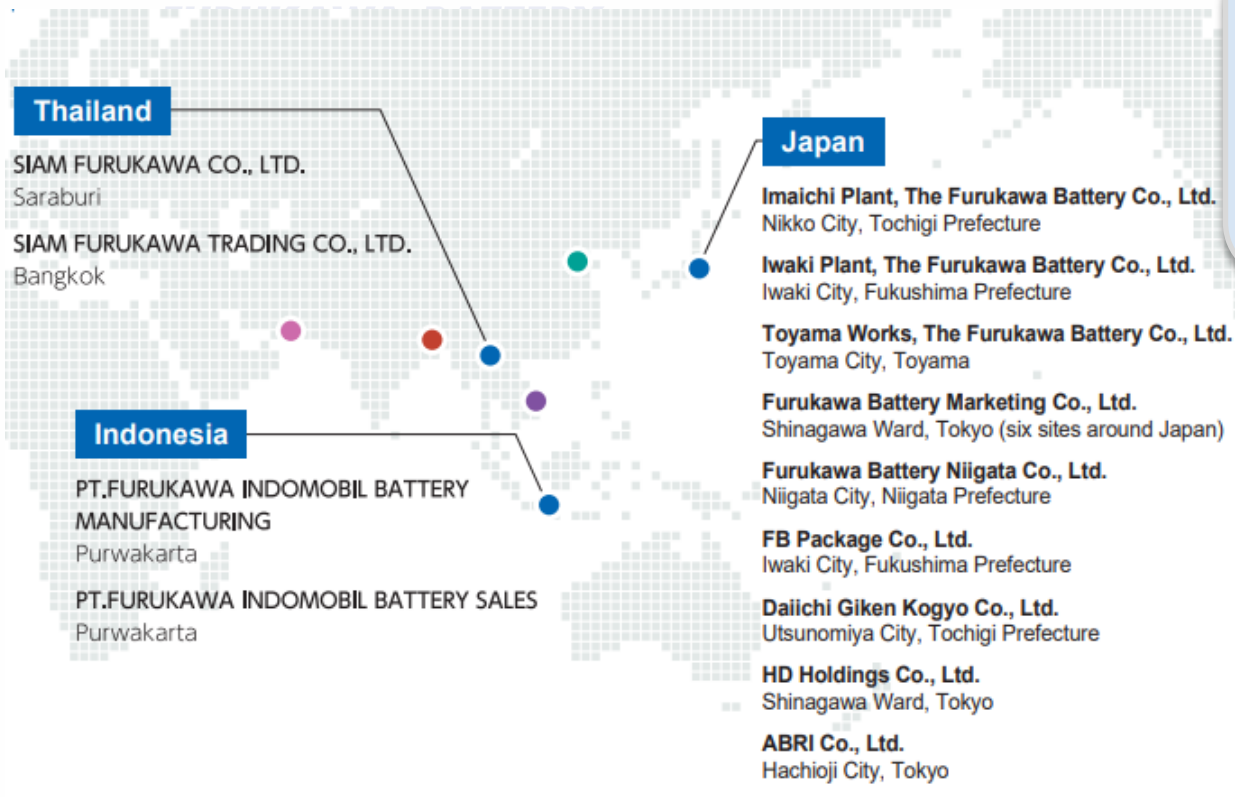
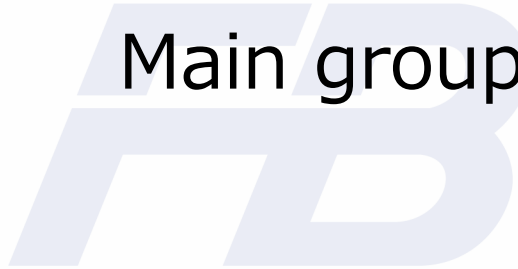
**The Furukawa Battery Co., Ltd.
Global Business Development Dept.
ESS Solution Division**

Presentation outline

- Corporate Information
- Our Products
- 20 Year-Life Lead-acid Battery for Renewable Energy
- Advantages of Lead-acid Battery
- Examples of Deliveries

Corporate information

Main group companies and production sites



- Established in 1950
- Capital JPY 1.64 Billion
- Annual Sales JPY 75.4 Billion (2023)
- Employees 2,404 (including consolidated subsidiary)

Main partners

- Dry Cell and Storage Battery Joint Stock Company (PINACO)
Ho Chi Minh, Vietnam
- Exide Industries Limited
Kolkata, India
- EXIDE Pakistan Limited
Karachi, Pakistan
- Shandong Sacred Sun Power Sources Co., Ltd
Shandong, China
- East Penn Manufacturing Company, Inc.
Pennsylvania, USA



Our products

■ Lead-acid Battery

- Automotive & motorcycle battery
- Industrial batteries such as UPS, **solar power energy storage system**, etc...



■ Alkaline Battery

- Railroad vehicles, aerospace, emergency lighting-alarm system

■ Power Supply

- Switching DC power supply
- Uninterruptible power supply (UPS)



■ Lithium-ion Battery

- Satellite
- Drone



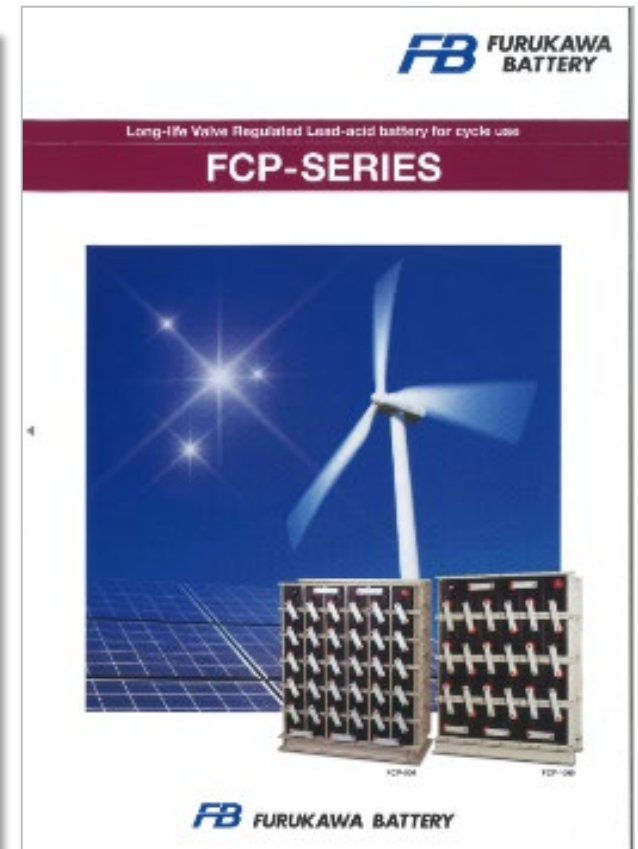
FCP series Long Life Lead-Acid Battery for Renewable Energy

FCP series

Long-life valve-regulated lead-acid battery

➤ Profits

- Suitable for renewable energy system
- Significantly improved cycle life performance
- Super low-maintenance
- Excellent safety performance
- Saving initial and running cost



FCP series line-up

	FCP Series	
Type	FCP-500	FCP-1000
Capacity / Voltage	500 Ah / 2 V	1000 Ah / 2 V
Number of cycles (DOD 70%)	4,500 cycles Discharge current: 0.23 C _{10A}	
Maximum operating life	Approx. 15 years*	
Installation method	Horizontal multiple superimposed loading	
Maximum charge current during operation	100 A(0.2 C _{10A})	200 A(0.2 C _{10A})
Maximum discharge current during operation	200 A(0.4 C _{10A})	400 A(0.4 C _{10A})
Battery monitoring unit	BMU for lead-acid storage batteries	
Remarks	Standard type	



FCP-500-12 unit

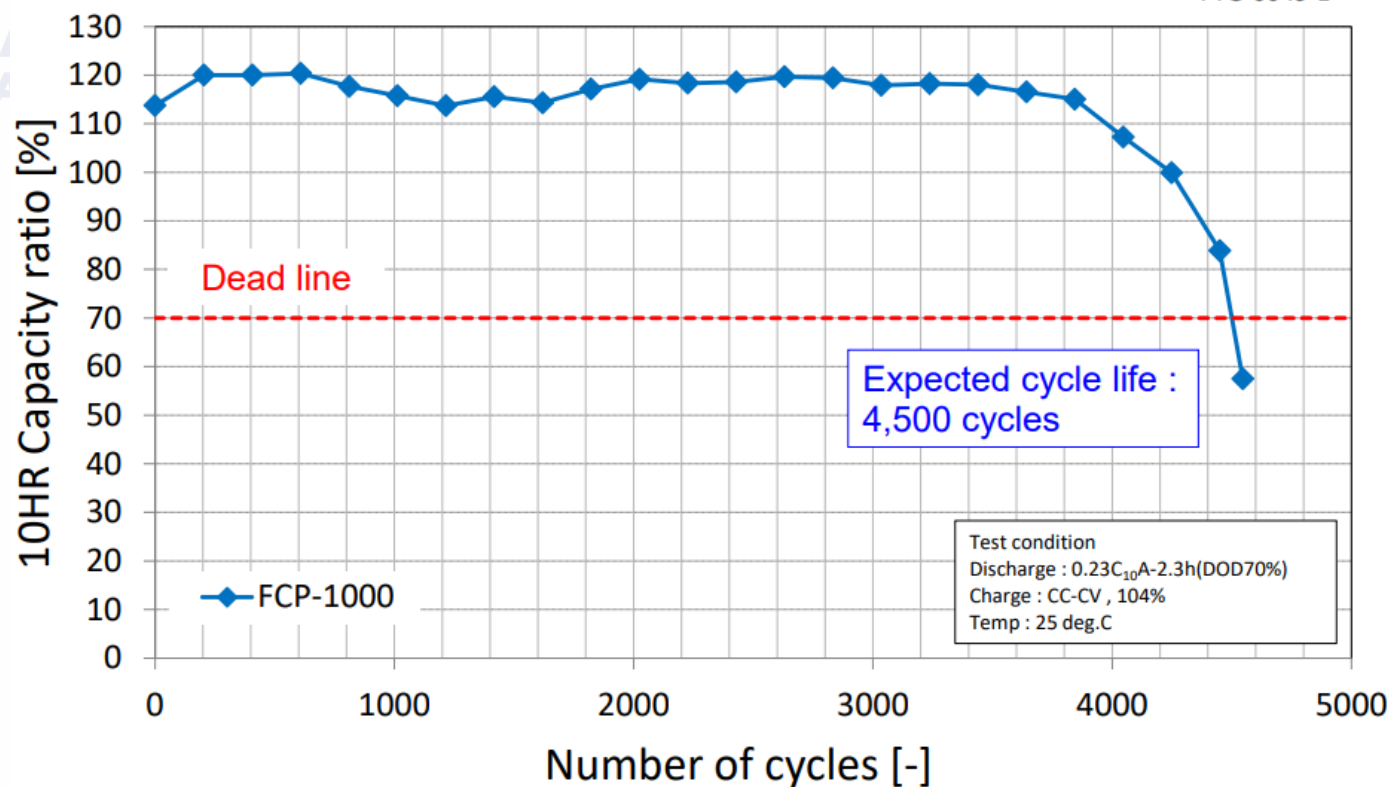


FCP-1000-12 unit

*When used 300 times per year (25°C)

Relationship between the number of cycles and 10HR capacity ratio of FCP-1000

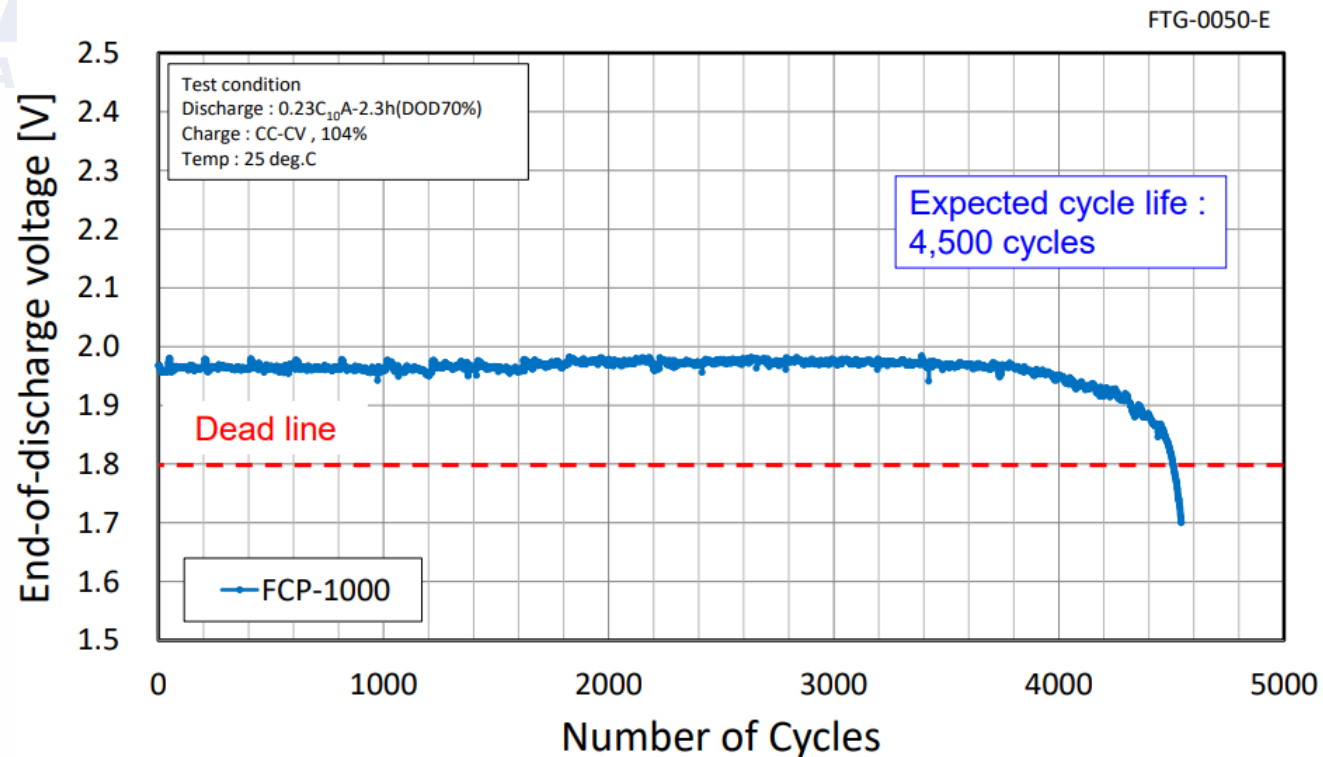
FTG-0049-E



Note 1)Depth of discharge is the ratio for the 0.23CA capacity. Amount of charge is 104% to 100% of discharge.

Note 2)The battery life, which widely varies depending on the operating temperature, use and other conditions, is not a guaranteed value.

Relationship between the number of cycles and end-of-discharge voltage of FCP-1000



Note 1)Depth of discharge is the ratio for the 0.23CA capacity. Amount of charge is 104% to 100% of discharge.

Note 2)The battery life, which widely varies depending on the operating temperature, use and other conditions, is not a guaranteed value.

Newly launched FCP-S series 20 year-life battery

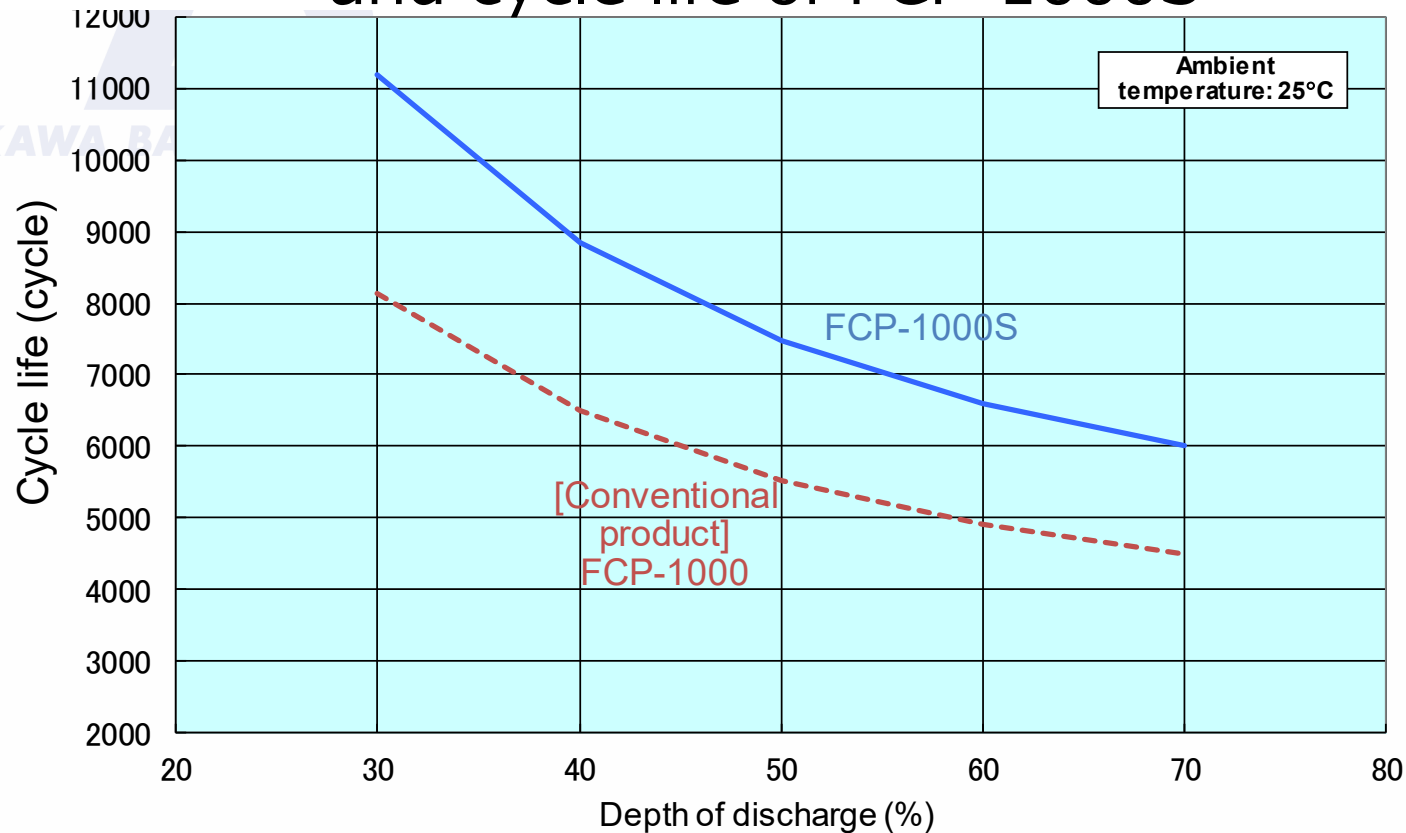
	FCP Series	
Type	FCP-500S	FCP-1000S
Capacity / Voltage	500 Ah / 2 V	1000 Ah / 2 V
Number of cycles (DOD 70%)	6,000 cycles Discharge current: 0.23 C ₁₀ A	
Maximum operating life	Approx. 20 years*	
Installation method	Horizontal multiple superimposed loading	
Maximum charge current during operation	100 A(0.2 C ₁₀ A)	200 A(0.2 C ₁₀ A)
Maximum discharge current during operation	200 A(0.4 C ₁₀ A)	400 A(0.4 C ₁₀ A)
Battery monitoring unit	BMU for lead-acid storage batteries	
Remarks	Long life type	

*When used 300 times per year (25°C)



FCP-1000S-6 unit

Relationship between depth of discharge and cycle life of FCP-1000S



Note) 1. Depth of discharge: ratio to discharge capacity of 0.23C₁₀A. Charge amount: 104%.

2. It is not a guaranteed value since the life of a storage battery varies greatly depending on operating temperature, application, usage conditions, etc.



Newly launched FCP-S series 20 year-life battery

Q. How did we achieve 20 year-life?

A. The improvement of positive/negative plates and increased durability of battery components.

Q. What is the advantage of a super-long-life battery for ESS?

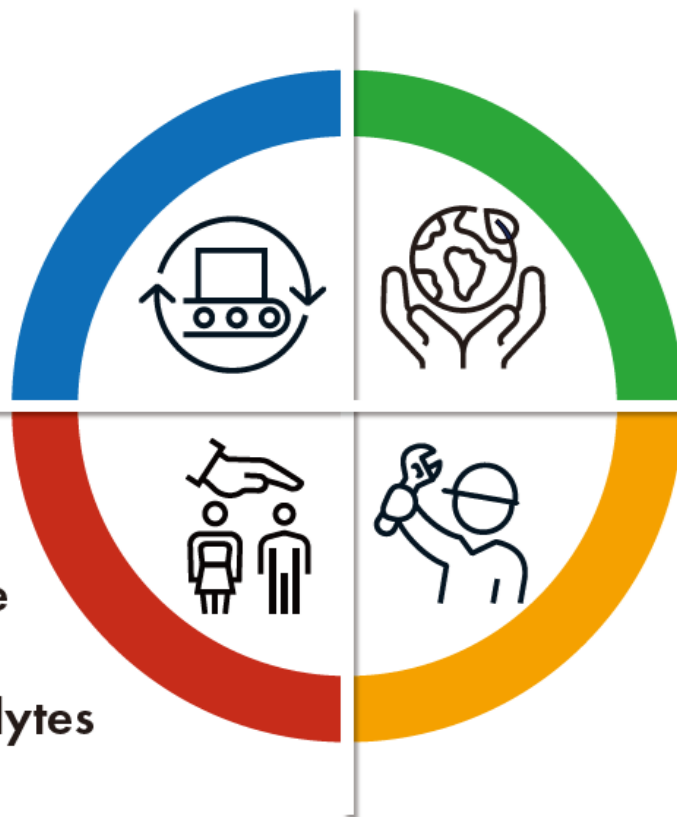
A. Reduced replacement frequency.

You can replace batteries with other equipment, such as PV panel.

Advantages of lead-acid battery for renewable energy

Stable supply

- No rare metals



Easy recycled product

- 99 % recyclable

Safety

- Superior heat resistance
high temperatures
- Non-flammable electrolytes

Easy maintenance

- No need to refill electrolytes
- Constant monitoring is not required

Kyudenko

Off-grid energy management system Ogi city hall in Saga, Japan



One of the biggest lead-acid battery ESS in Japan
FCP-1000×1728 pcs (3,456 kWh)



✓ Power supplied
by solar power **24/7**

✓ **72 hours** of power
backup available

Electricity generated more than regular usage is stored in a storage battery, which can supply power for 72 hours in an emergency in unseasonable weather or a disaster.

Ogi City office
<https://www.city.ogi.lg.jp/main/37807.html>

Grant Aid Program for Rehabilitation and Reconstruction from Typhoon Yolanda



*FCP-1000x24 48V 1000Ah, 48kWh

Helping the Philippines Recover from Typhoon Yolanda



Thank you!