

Precautions for Safe Use

- To use the battery safely and properly, be sure to read the instruction manual before use.

Danger

- For stationary batteries, ensure that the room is well ventilated so that the hydrogen concentration is 0.8% or less. Failure to do so may cause fire or explosion.
- Do not install the battery in a poorly-ventilated area where the hydrogen concentration becomes more than 0.8% or near open flame. Doing so may cause fire or explosion.

Caution

- The service temperature range of the battery is from -15 to 45°C. Using the battery outside this range may accelerate deterioration or cause the battery to freeze or overheat, resulting in damage or deformation.
- Do not use this battery where it is exposed to direct sunlight. Doing so may cause the parts of the battery to deteriorate.
- Do not expose the battery to water or seawater. Doing so may cause damage to the battery or fire, or cause the terminals or connecting plates to corrode.
- Do not use the battery near a heat source. Doing so may cause damage to the battery or cause the battery life to shorten.
- Do not use the battery in dusty areas. Doing so may cause a short-circuit.
- Charge the battery under the charging conditions recommended by Furukawa Battery. Failure to do so may result in insufficient charging, electrolyte leakage, temperature rise, explosion, deterioration in performance, or reduced service life.
- Ensure that the maximum discharge current is not exceeded for more than 1 minute for 3C₁₀A or for more than 5 seconds for 6C₁₀A. Failure to do so may cause damage to the battery.
- Periodically inspect the battery. If the results deviate from the standards specified in the instruction manual, follow the steps in the instruction manual. Using the battery with such deviations may cause damage to the battery, or burnout.



ISO9001 certified
JQA-1118
(THE FURUKAWA BATTERY
CO., LTD.)



ISO14001 certified
JQA-EM0380
(Iwaki and Imaichi Plants)

**Actual colors may differ slightly from those in the photo due to printing limitations.
The illustrations in this catalog are conceptual images.*

Contact Information

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**FB FURUKAWA
BATTERY**

Long-life Valve Regulated Lead-acid battery for cycle use

FCP-SERIES



FB FURUKAWA BATTERY

Furukawa long life battery suitable for cycle use

Furukawa has achieved a space-saving unit configuration with higher durability and longer life that is optimized for cycle use that alternately repeats battery charge and discharge.

●Longer cycle life

Improved durability and longer cycle life achieved by highly corrosion-resistant alloy used in the positive electrode grid, higher density of active materials and the use of additives which suppress the softening of positive electrodes and active materials.

●Partial charge operation allowed

Operation under partial state of charge (PSOC) allowed by superior charge acceptance (to conventional lead batteries) achieved by improved conductivity of the negative electrodes by new additives and higher conversion rate of lead sulfate to active materials.
※ Equalized charge required.

●Multistage loading allowed

- ★ Save installation space
- ★ Shorter time for installation
- ★ Easier maintenance
(Front placement of battery cell terminals)



3 unit stacks

Help from Furukawa for cycle use that will be more widely used in the next generation.

Wide cycle use coverage

- Natural energy**
(PV generation, wind power generation, etc.) systems
- Electric power storage systems**
(load leveling, peak cut)



Main Specifications

Type			FCP-500	FCP-1000
Capacity (25°C)	Nominal Voltage		2V	2V
	0.1C ₁₀ A discharge (1.8 V/cell)		500Ah	1000Ah
	0.16C ₁₀ A discharge (1.8 V/cell)		425Ah	850Ah
	0.23C ₁₀ A discharge (1.8 V/cell)		375Ah	750Ah
	0.4C ₁₀ A discharge (1.8 V/cell)		300Ah	600Ah
Capacity (5°C)	0.1C ₁₀ A discharge (1.8 V/cell)		465Ah	930Ah
	0.16C ₁₀ A discharge (1.8 V/cell)		385Ah	770Ah
	0.23C ₁₀ A discharge (1.8 V/cell)		335Ah	670Ah
	0.4C ₁₀ A discharge (1.8 V/cell)		265Ah	530Ah
Mono cell	Dimensions (mm)	Height	508	508
		Width	172	172
		Length	166	303
	mass (kg)		41	75

※ C₁₀ is capacity of 10 hour rate.

Unit Type			FCP-500-12	FCP-1000-12
Unit	Storage cell no.		6cell	6cell
	Voltage		12V	12V
	Capacity (10HR)		500Ah	1000Ah
	Nominal Energy Capacity		6kWh	12kWh
	Dimensions (mm)	Height	200	336
		Width	1141	1141
		Depth	505	505
	Mass(kg)		280	500
	Mass Energy Density (Wh/kg)		21	24
	Volume Energy Density (kWh/m ³)		51	61
	Floor Load (kg/m ²)		486	868

Main Performance

Estimated life at 25°C *The Estimated life is not a guaranteed value. *The total discharge electric quantity and usage period, which vary depending on the operation conditions and other factors, are not guaranteed values.	Cycle no. (Our company's recommendation condition)	4200 cycles (DOD 70%)
	Estimated life	14 years (300 cycles / year)
	Above condition	Discharge: within 0.23CA; charge: multi-step charging or CC+CV
	Charge Amount	104%
	Usage range as PSOC (e.g.)	SOC: 30-90%
	Control voltage (e.g.)	1.8V-2.35V / cell
	Equalizing charge voltage	2.45V / cell
	Total discharge electric quantity	2,200kAh
Maximum current at continuous operation	Charge	0.2C ₁₀ A
	Discharge	0.4C ₁₀ A
Operating temperature range	Charge	0 - 40°C
	Discharge	-15 - 45°C
	Storage	-15 - 40°C

※ DOD(Depth of discharge) ※ SOC(State of charge)

FCP-500 multi-unit battery combinations and outer dimensions (example)

Combination	Cell (s)	FCP-500-12 unit(s)	Block (s)	Nominal voltage of combined batteries (V)	Rated capacity (Ah / 10HR)	Outer dimensions of combined batteries (approx. mm)					Weight of combined batteries (approx.kg)
						Total height: A	Length: B1	Length: B2	Depth: C1	Depth: C2	
6-stack	36	6	1	72	500	1300	1141	—	560	—	1,710
6-stack 1 line side-by-side	72	12	2	144	500	1300	—	2532	560	—	3,420
6-stack 2 lines back to back	72	12	2	144	500	1300	1141	—	—	1075	3,500

Combination	Cell (s)	FCP-500-12 unit(s)	Block (s)	Nominal voltage of combined batteries (V)	Rated capacity (Ah / 10HR)	Outer dimensions of combined batteries (approx. mm)					Weight of combined batteries (approx.kg)
						Total height: A	Length: B1	Length: B2	Depth: C1	Depth: C2	
*4-stack	24	4	1	48	500	900	1141	—	560	—	1,150
*4-stack 1 line side-by-side	48	8	2	96	500	900	—	2532	560	—	2,300
*4-stack 2 lines back to back	48	8	2	96	500	900	1141	—	—	1075	2,380

* Reference

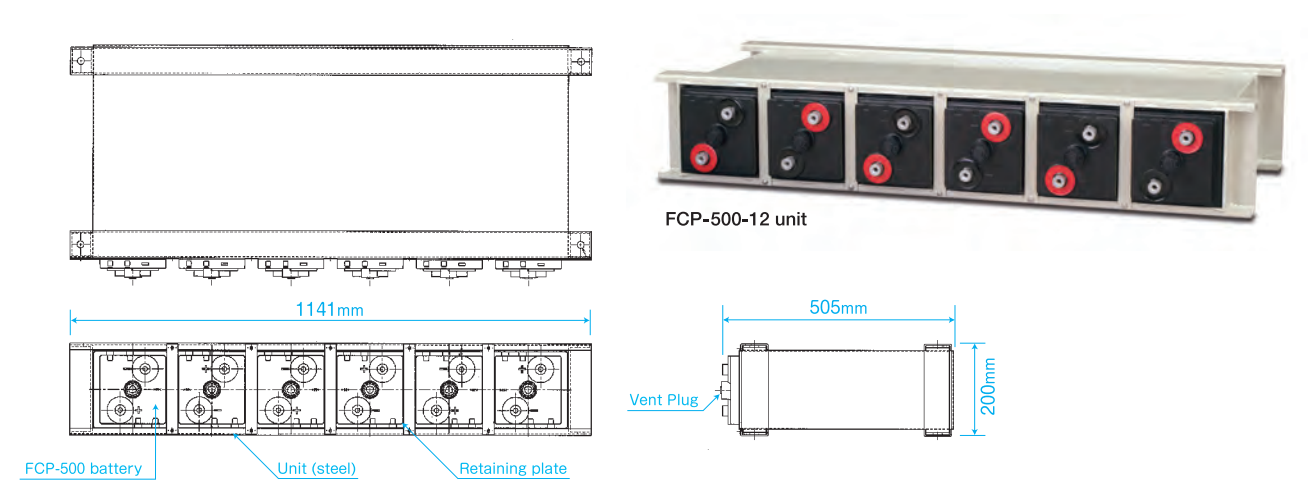
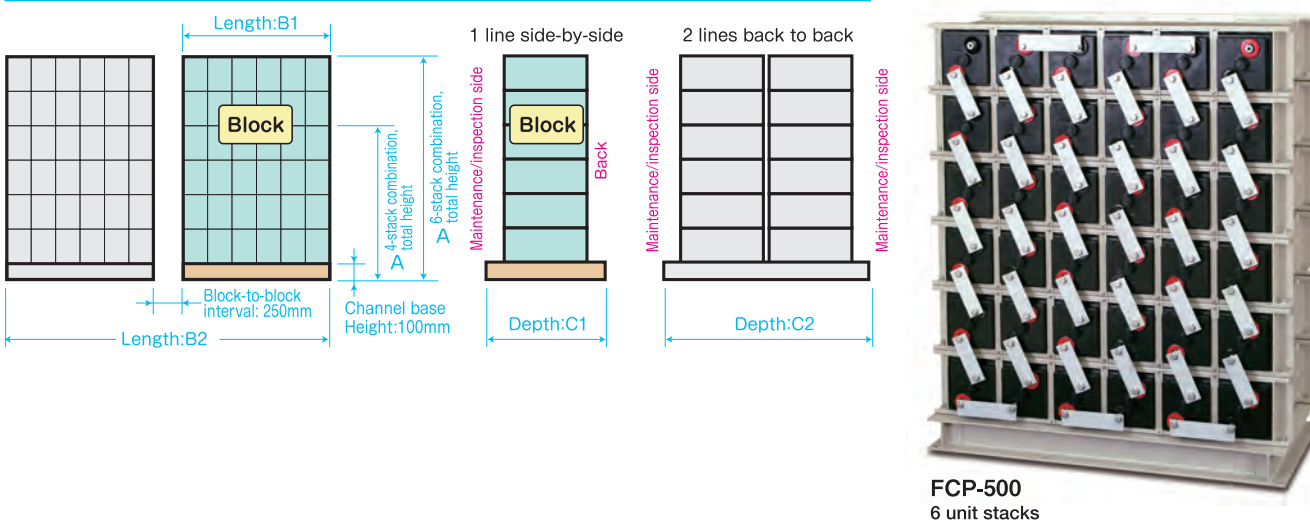


Diagram of combined multi-unit batteries



- Remarks
- A block formed by a set of multiple units loaded.
 - Standard blocks of ours are the six-stage loading.(FCP-500)
(Earthquake resistance: static horizontal acceleration is 1G or below, and static vertical acceleration is 0.5G or below.)
 - External dimensions given in Tables are references for our standard products.
 - Total heights do not include the terminals.
 - Total heights include the channel base .(100 mm)
 - Blocks are separated by 250 mm in horizontal installation.
 - Larger capacity achieved by parallel installation.
 - For customized installation and capacity, contact us.

FCP-1000 multi-unit battery combinations and outer dimensions (example)

Combination	Cell (s)	FCP-1000-12 unit(s)	Block (s)	Nominal voltage of combined batteries (V)	Rated capacity (Ah / 10HR)	Outer dimensions of combined batteries (approx. mm)					Weight of combined batteries (approx.kg)
						Total height: A	Length: B1	Length: B2	Depth: C1	Depth: C2	
4-stack	24	4	1	48	1000	1444	1141	—	560	—	2,150
4-stack 1 line side-by-side	48	8	2	96	1000	1444	—	2532	560	—	4,300
4-stack 2 lines back to back	48	8	2	96	1000	1444	1141	—	—	1075	4,380

Combination	Cell (s)	FCP-1000-12 unit(s)	Block (s)	Nominal voltage of combined batteries (V)	Rated capacity (Ah / 10HR)	Outer dimensions of combined batteries (approx. mm)					Weight of combined batteries (approx.kg)
						Total height: A	Length: B1	Length: B2	Depth: C1	Depth: C2	
*3-stack	18	3	1	36	1000	1108	1141	—	560	—	1,610
*3-stack 1 line side-by-side	36	6	2	72	1000	1108	—	2532	560	—	3,220
*3-stack 2 lines back to back	36	6	2	72	1000	1108	1141	—	—	1075	3,300

* Reference

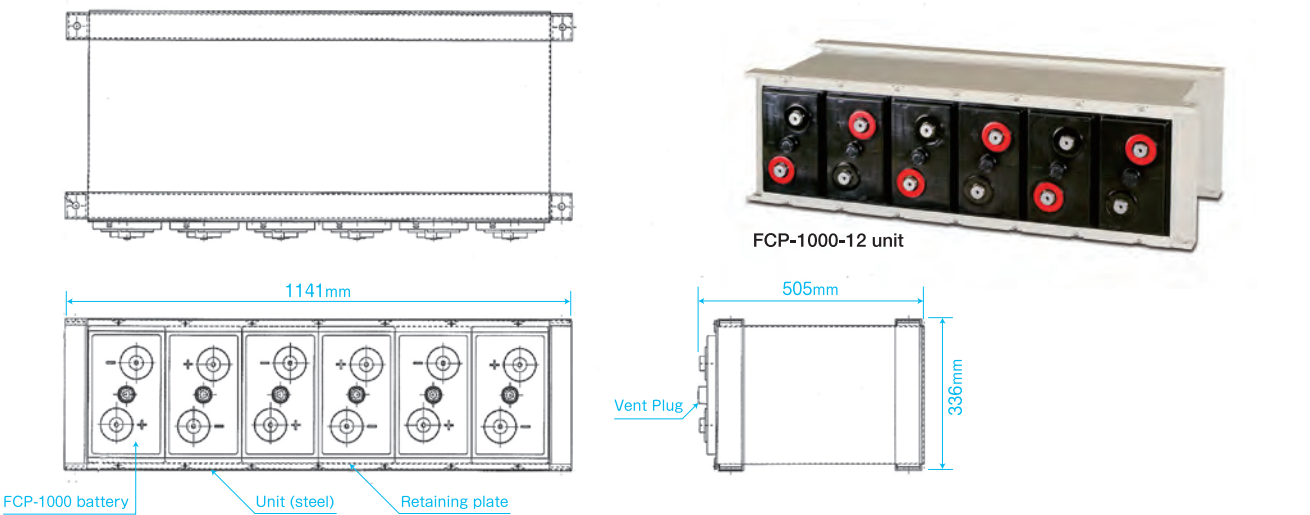
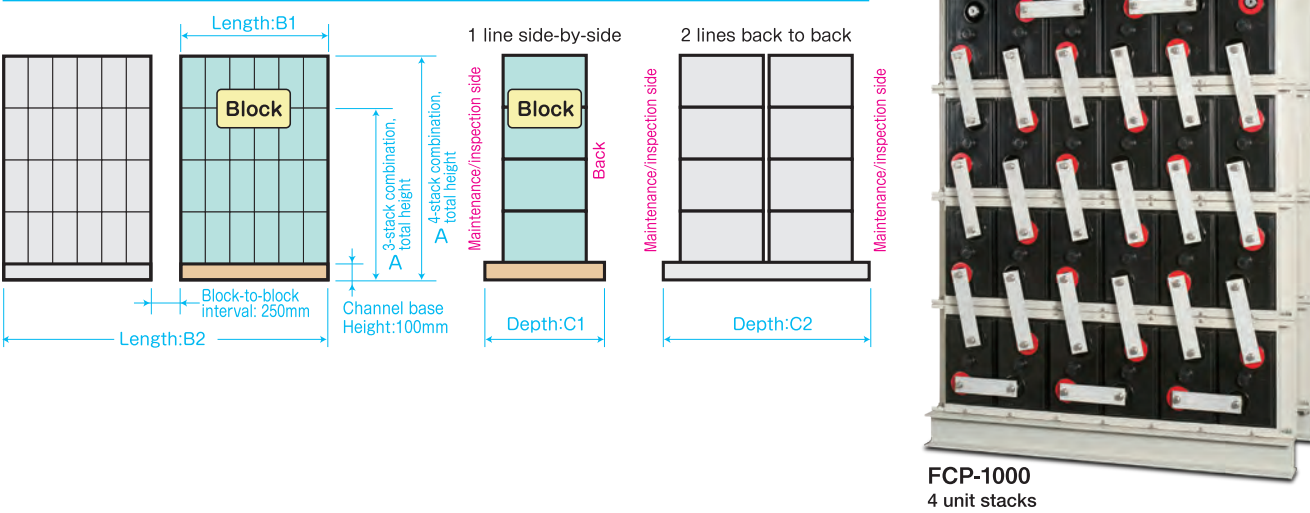
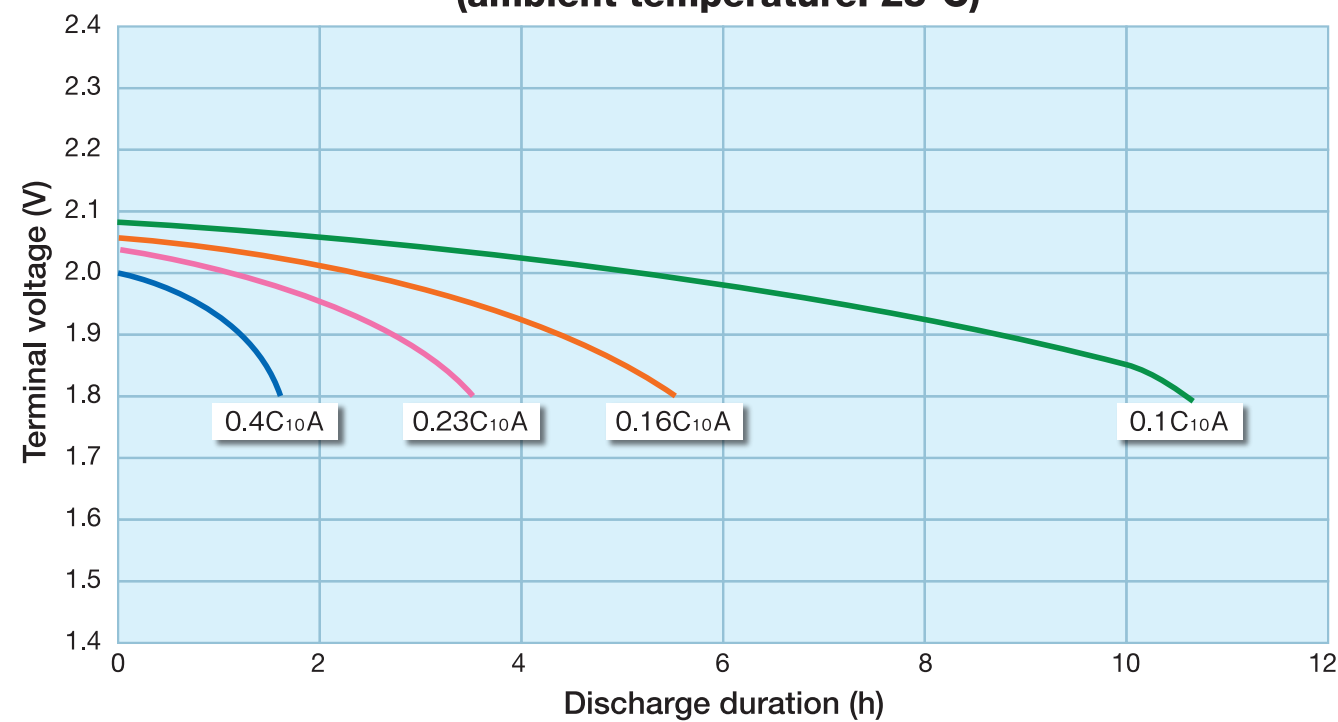


Diagram of combined multi-unit batteries



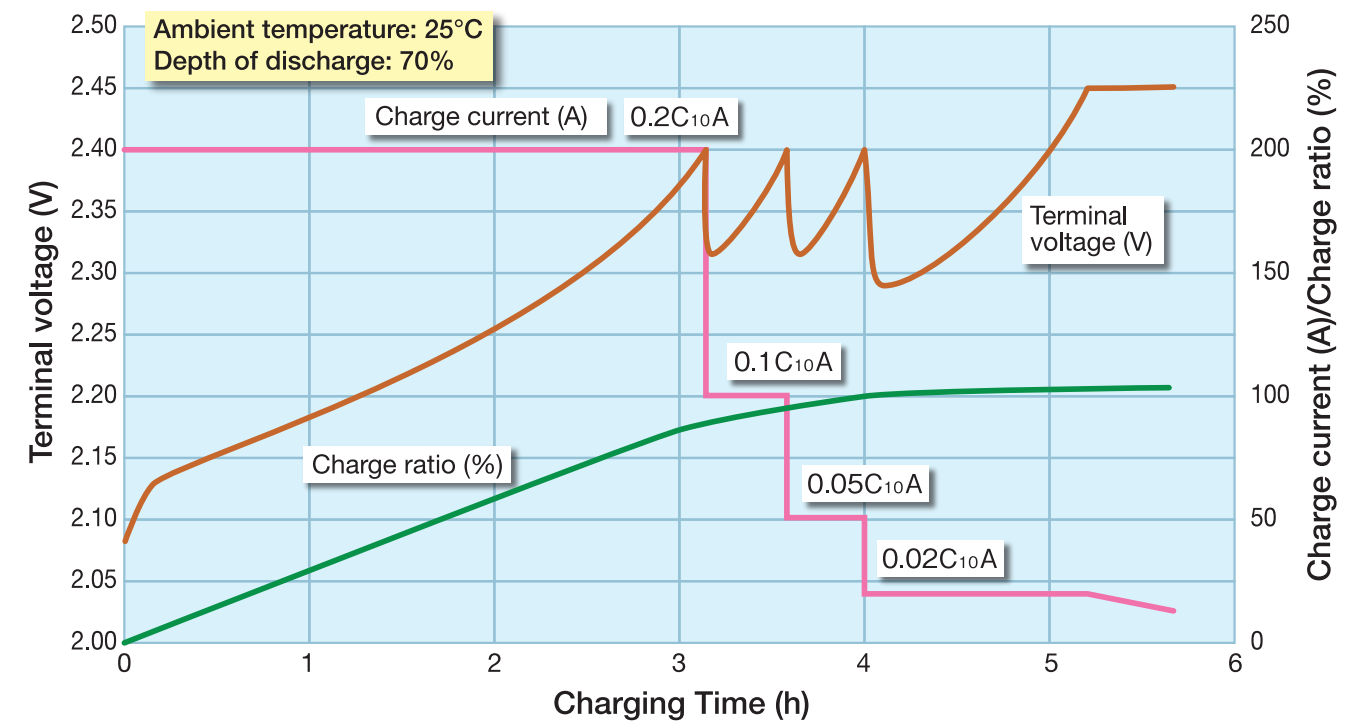
- Remarks
- A block formed by a set of multiple units loaded.
 - Standard blocks of ours are the four-stage loading.(FCP-1000)
(Earthquake resistance: static horizontal acceleration is 1G or below, and static vertical acceleration is 0.5G or below.)
 - External dimensions given in Tables are references for our standard products.
 - Total heights do not include the terminals.
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Discharge characteristic (example)
(ambient temperature: 25°C)



Note) Discharge characteristics vary depending on the charging condition and other such factors.
This characteristic graph is an example and does not guarantee the characteristics.

Multi-step charging characteristic (example)



Multi-step charging condition:

Step 1: 0.2C₁₀A → Step 2: 0.1C₁₀A → Step 3: 0.05C₁₀A (change charging voltage: 2.40 V/cell)
→ Step 4: 0.02C₁₀A (Voltage is set to 2.45 V/cell; charged up to 104% the discharge volume)

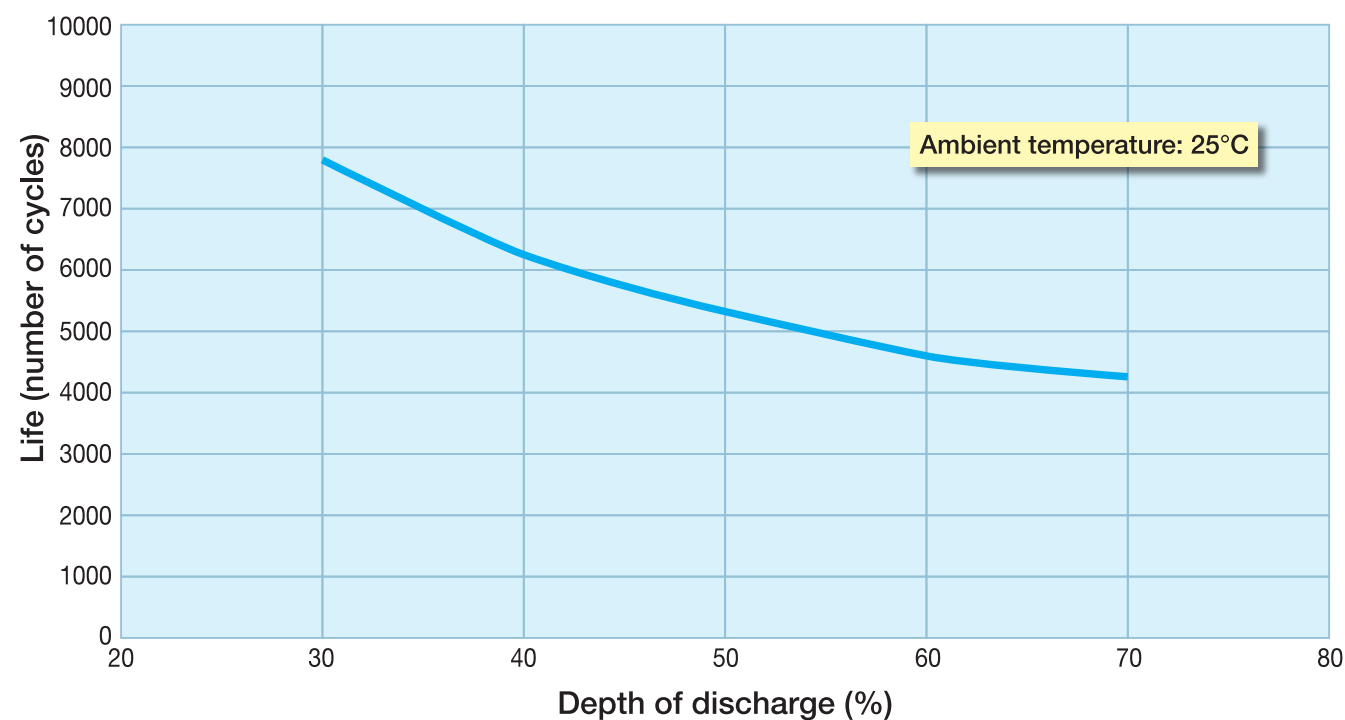
Memo) Discharge before charging: 0.1C₁₀A × 7 h

Note 1) Charge characteristics vary depending on the condition of the battery.

This characteristic graph is an example and does not guarantee the characteristics.

Note 2) This graph is in case of FCP-1000.

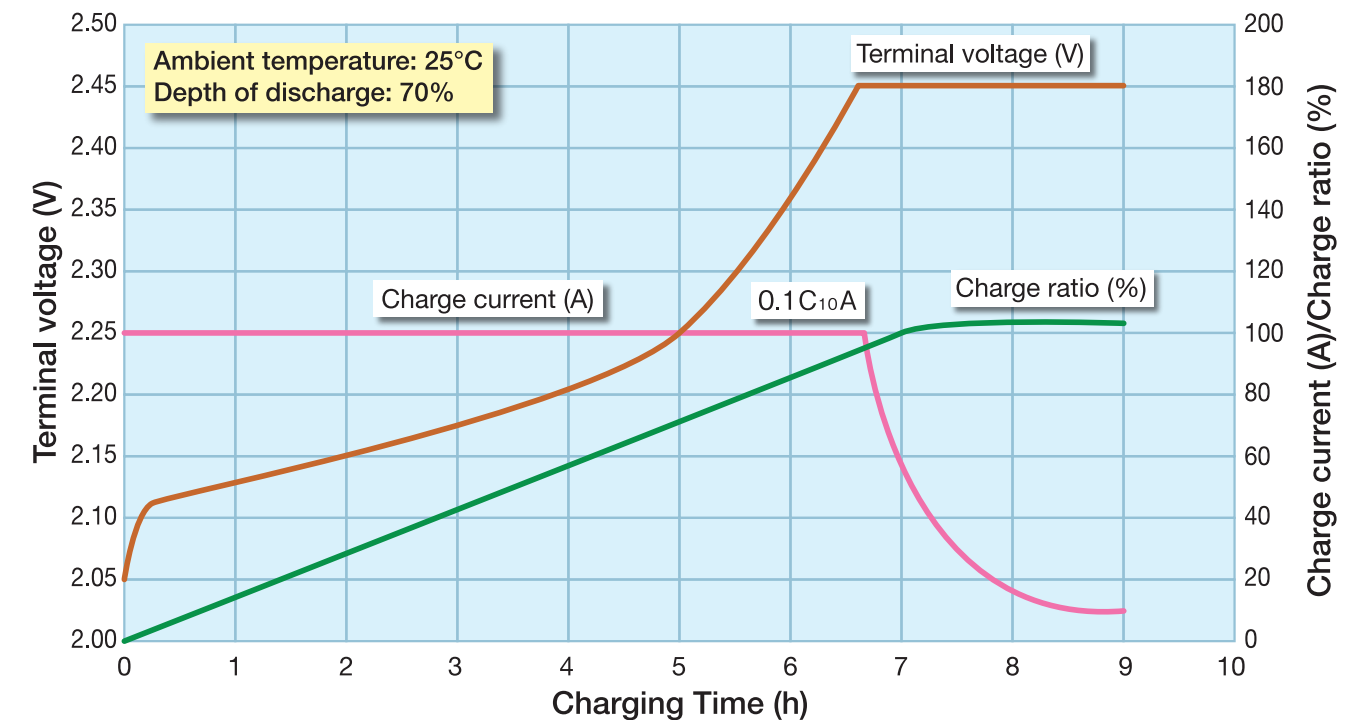
Relationship between depth of discharge and life



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.

Continuous current/voltage charge characteristic (example)



Continuous current/voltage charge condition: Voltage is set to 2.45 V/cell; charged up to 104% the discharge volume with a maximum charge current of 0.1C₁₀A

Memo) Discharge before charging: 0.1C₁₀A × 7 h

Note 1) Charge characteristics vary depending on the condition of the battery.

This characteristic graph is an example and does not guarantee the characteristics.

Note 2) This graph is in case of FCP-1000.