

# Powering The Future



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*energy*



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OASIS™

# G31 M

( 12V 105 Ah @ C20)

12V G31M Battery

(VRLA AGM GEL)

Developed by scientists at Firefly Energy, Microcell™ Carbon Foam is a material that's revolutionizing the battery industry. Compared to spongy lead negative plates, one of the main components of conventional lead acid batteries, carbon foam Negative plates deliver longer service life, increased energy efficiency and better performance under extreme conditions. That's why we used it to create our revolutionary Firefly MCF battery.



Firefly carbon foam design resists hard sulfation and corrosion [two of the primary causes of failure in lead-acid batteries], while dramatically increasing the surface area in contact with the Active material within the battery, resulting in greater energy capacity, faster recharges, and deeper discharge capability.

## SALIENT FEATURES

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- Sealed and requires no maintenance
- More than 3 - times cycle life compared to flooded gel & AGM VRLA batteries at 50% DOD.
- Lower cost per kWh delivered compared to premium VRLA batteries.
- Unmatched ability to recover from extended storage in discharged state.
- Throughput efficiency greater than 90%.
- Improved high/low temperature performance. Superior protection against corrosion and sulfation related problems.
- Lowest Cost of ownership Industry leading warranty.
- Compatible with existing lead acid battery recycling infrastructure.
- Outstanding long life even under partial state of charge operation.

# MCF- MICROCELL CARBON FOAM TECHNOLOGY

# 12V G31M Battery

## (VRLA AGM GEL)

<b>Partial state of charge Cycling Efficiency</b>	Ampere-hour >97% & watt hour >90%
<b>Nominal Voltage</b>	12V
<b>Maximum Charge Voltage</b>	14.40V
<b>Maximum Charge Current</b>	0.5C Amps current limit for continuous charge @ 14.40V constant voltage charging 1C Amps can be tolerated for Sporadic session
<b>Internal Resistance</b>	5.0 Milli ohms ( Fully charged condition)
<b>Shelf life@25°C(77°F)</b>	2 years
<b>Self- Discharge</b>	<2% per Month
<b>CCA</b>	630 Amps

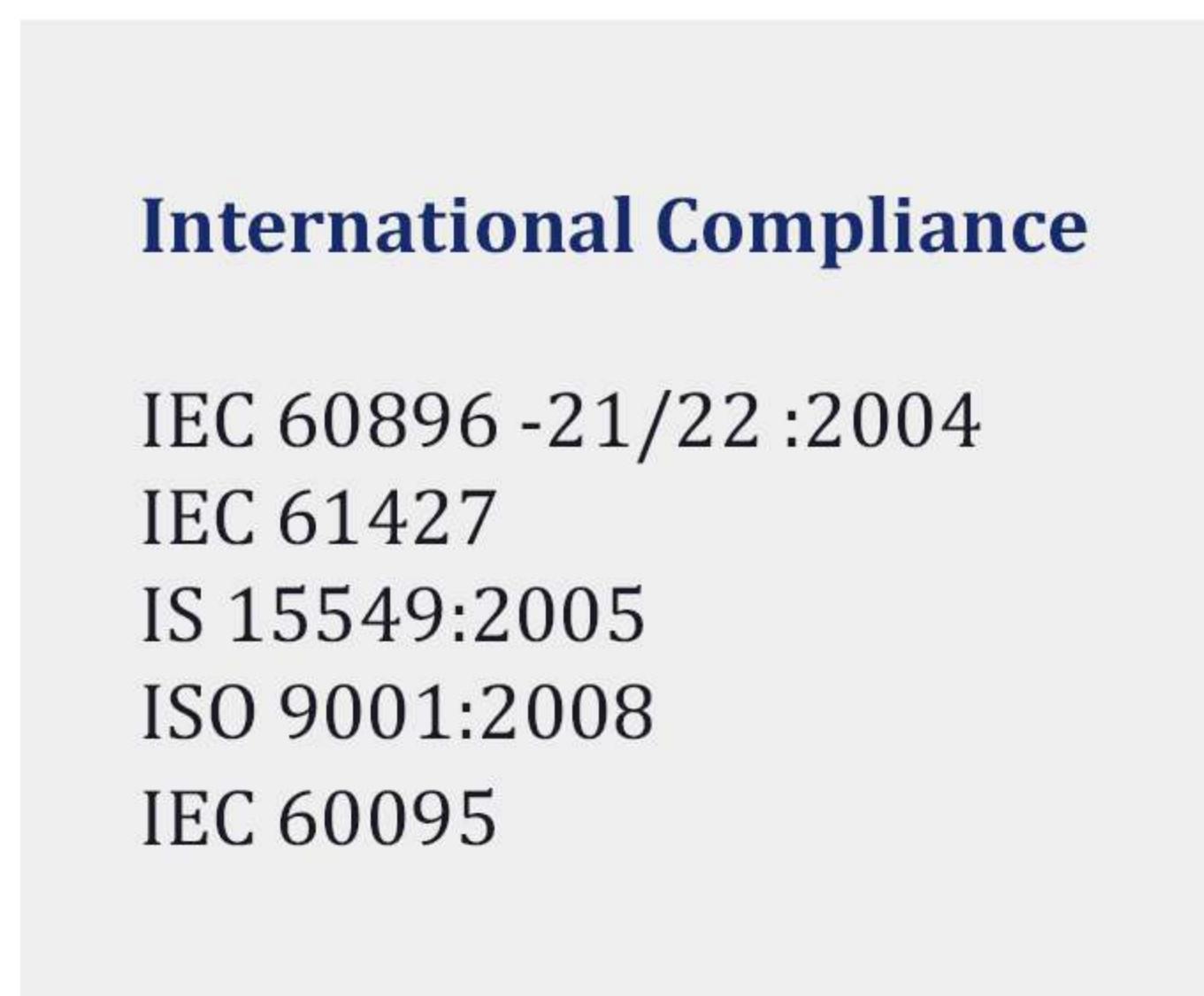
<b>Temperature</b>	<b>Low</b>	<b>High</b>
<b>Operation</b>	-20°C/-4°F	50°C/122°F
<b>Storage</b>	-30°C/-22°F	60°C/140°F

<b>Weights &amp; Dimensions</b>	
<b>Length</b>	13.0 in/330 mm
<b>Width</b>	6.8 in/171 mm
<b>Height</b>	8.6 in/218 mm
<b>Weight</b>	69.5 lbs /31.5 kgs
<b>Volume</b>	Volume 760.2 Cu.in/12.3 liters

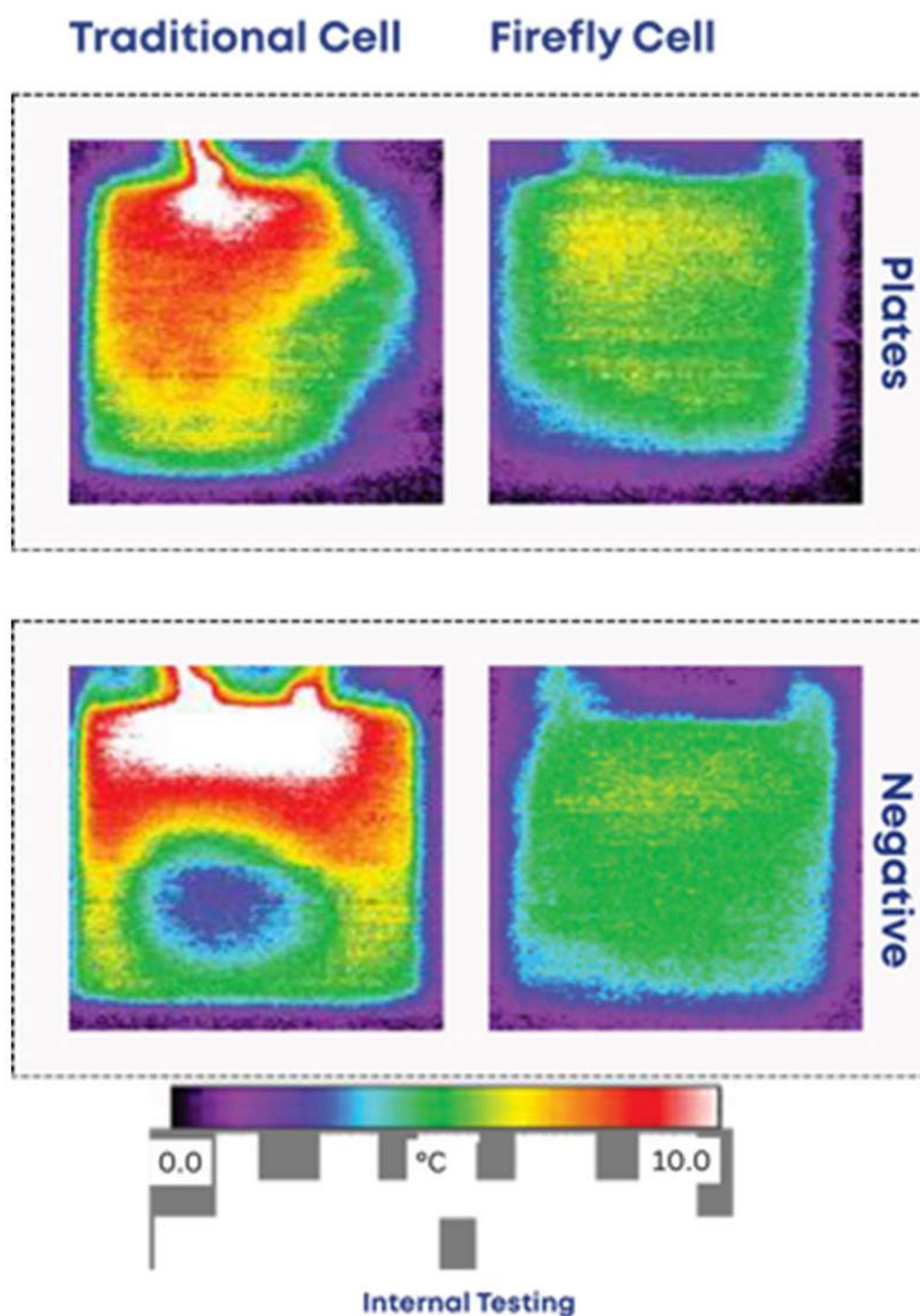
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<b>Construction</b>	
<b>Terminal Configuration</b>	3/8" - 16UNC
<b>Case/Cover</b>	ABS
<b>Racks</b>	Available Upon Request



Charge Temperature Compensation					
Operating Temperature	'C	-20	25	40	55
	°F	-4	77	104	13.1
Absorption Charge Voltage	v	15.6	14.4	14.1	13.98



Infrared thermal images snapped at the end of a 5C (12 minute) discharge of both a Firefly 3D cell and a Traditional cell.

**More uniform temperature distribution, as the Carbon Foam is thermally conductive, results in**

- Uniform current density distribution.
- Higher overall active material utilization.
- Less localized positive grid corrosion.
- Less localized positive active material wear out.

# DATASHEET

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MODEL	<b>PD12D1-G31M</b>
VOLTAGE	<b>12</b>
CAPACITY	<b>105Ah @ 20Hr</b>
MATERIAL	<b>ABS</b>
BATTERY	<b>VRLA AGM+Gel / Non-Spillable / MaintenanceFree</b>
COLOR	<b>Blue container/Light Yellow cover</b>
WATERING	<b>No Watering Required</b>

## PHYSICAL SPECIFICATIONS

BCI	MODEL NAME	DIMENSIONS C INCHES (mm) (± 2mm)			TERMINAL TYPE	WEIGHT I LBS. (kg) (± 3%)	HANDLES	INSTALLATION ORIENTATION
G31-M	PD12D1 G31M	LENGTH 13.0 inch (330 mm)	WIDTH 6.73 inch (171 mm)	HEIGHT 8.58 inch (218 mm)	3/8 "	68.3 lbs (31 kgs.)	Plastic Handle	Horizontal and Vertical

## ELECTRICAL SPECIFICATIONS

VOLTAGE	CRANKING PERFORMANCE		CAPACITY <sup>A</sup> MINUTES	CAPACITY <sup>B</sup> AMP-HOURS (Ah)			INTERNAL RESISTANCE (mΩ)	SHORT CIRCUIT CURRENT (amps)
12	C.C.A. <sup>D</sup> @0°F	C.A. <sup>E</sup> @32°F	@ 25 Amp	5-Hr	10-Hr	20-Hr	5.00 (max)	2625 (max)
	630	756	210	87	100	105		

## CHARGING INSTRUCTIONS

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### CHARGER VOLTAGE SETTINGS (AT 77°F/25°C)

SYSTEM VOLTAGE	12V	24V	36V	48V
<b>Maximum Charge Current (A)</b>	50% of C <sub>20</sub>			
<b>Absorption Voltage (2.40 V/cell)</b>	14.40	28.80	43.20	57.60
<b>Float Voltage (2.25 V/cell)</b>	13.50	27.00	40.50	54.00

Do not install or charge batteries in a sealed or non-ventilated compartment. Constant under or overcharging will damage the battery and shorten its life as with any battery.

### CHARGING TEMPERATURE COMPENSATION

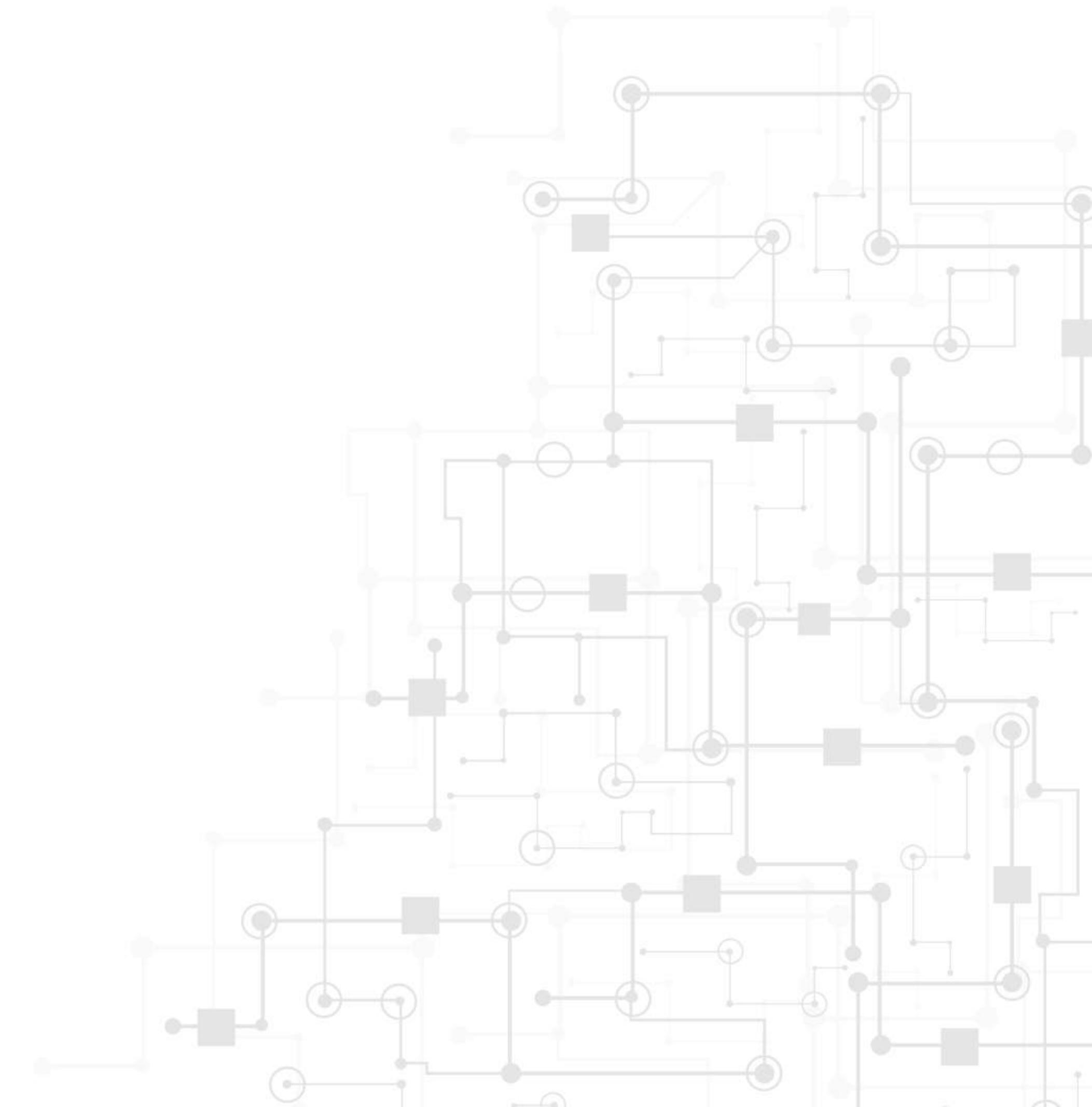
ADD	SUBTRACT
0.005 volt per cell for every 1°C below 25°C 0.0028 volt per cell for every 1°F below 77°F	0.005 volt per cell for every 1°C above 25°C 0.0028 volt per cell for every 1°F above 77°F

### OPERATIONAL DATA

OPERATING TEMPERATURE	SELF DISCHARGE
-40°F to 140°F (-40°C to +60°C). At temperatures below 32°F (0°C) maintain a state of charge greater than 60%.	Less than 3% per month @20°C depending on storage temperature conditions will increase or decrease

### STATE OF CHARGE MEASURE OF OPEN-CIRCUIT VOLTAGE

PERCENTAGE CHARGE	CELL	12 VOLT
100	2.15	12.90
75	2.08	12.50
50	2.03	12.20
25	1.98	11.90
0	1.93	11.60



## TERMINAL TYPE

15	3/8	3/8
<b>Battery Height with Terminal in Inches (mm)</b> 8.58 inch (218 mm)		

## RECYCLE RESPONSIBLY



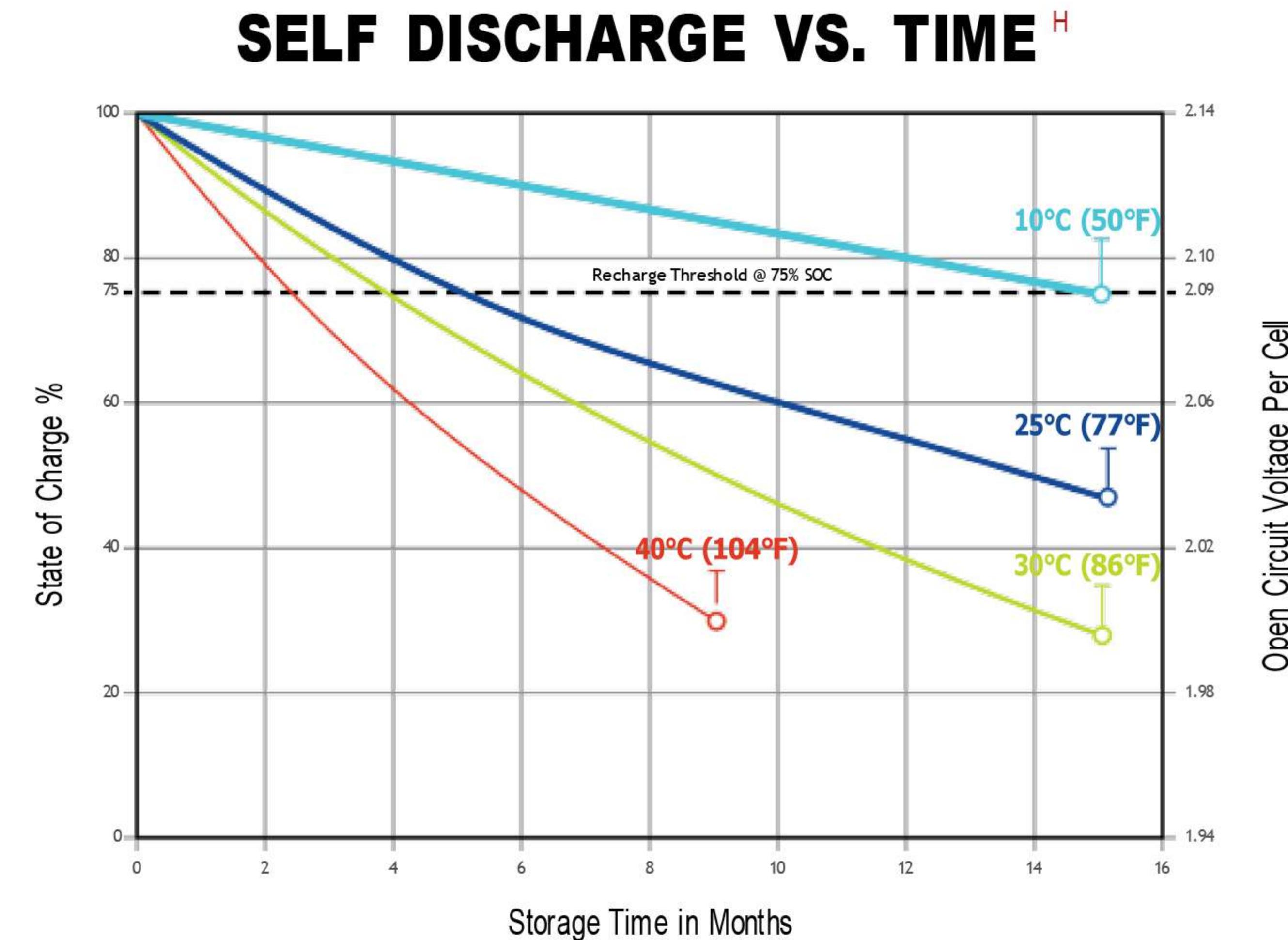
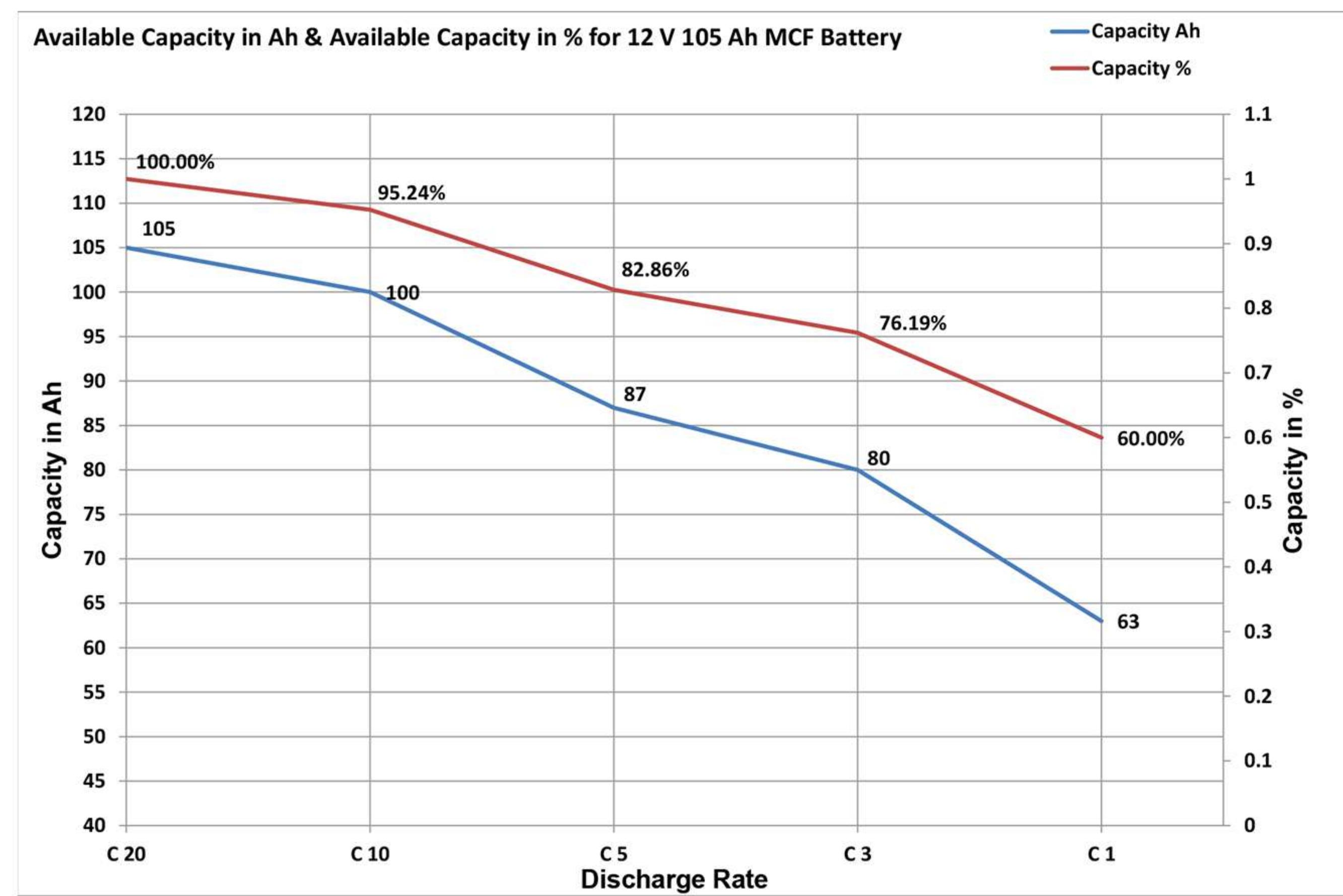
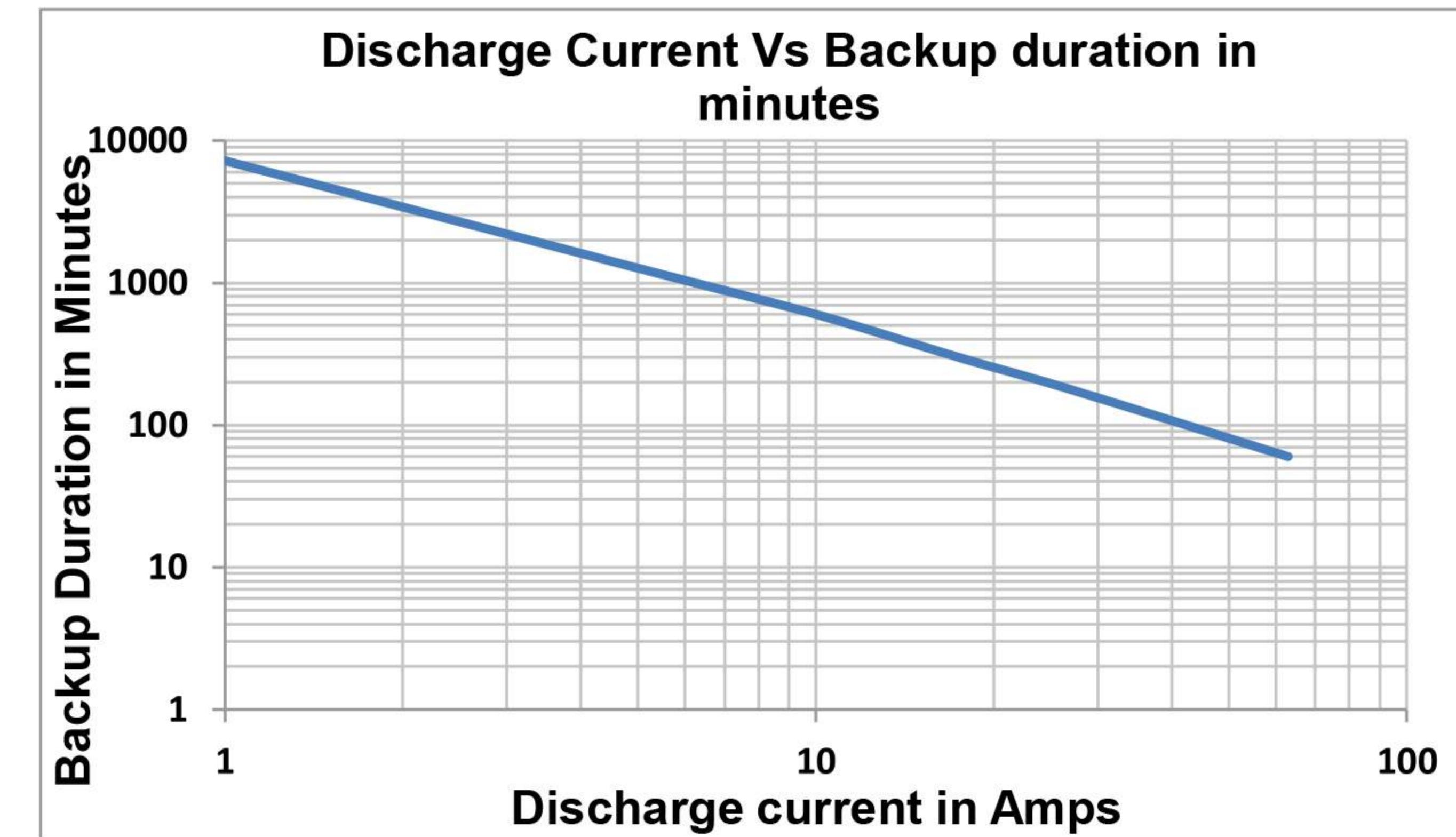
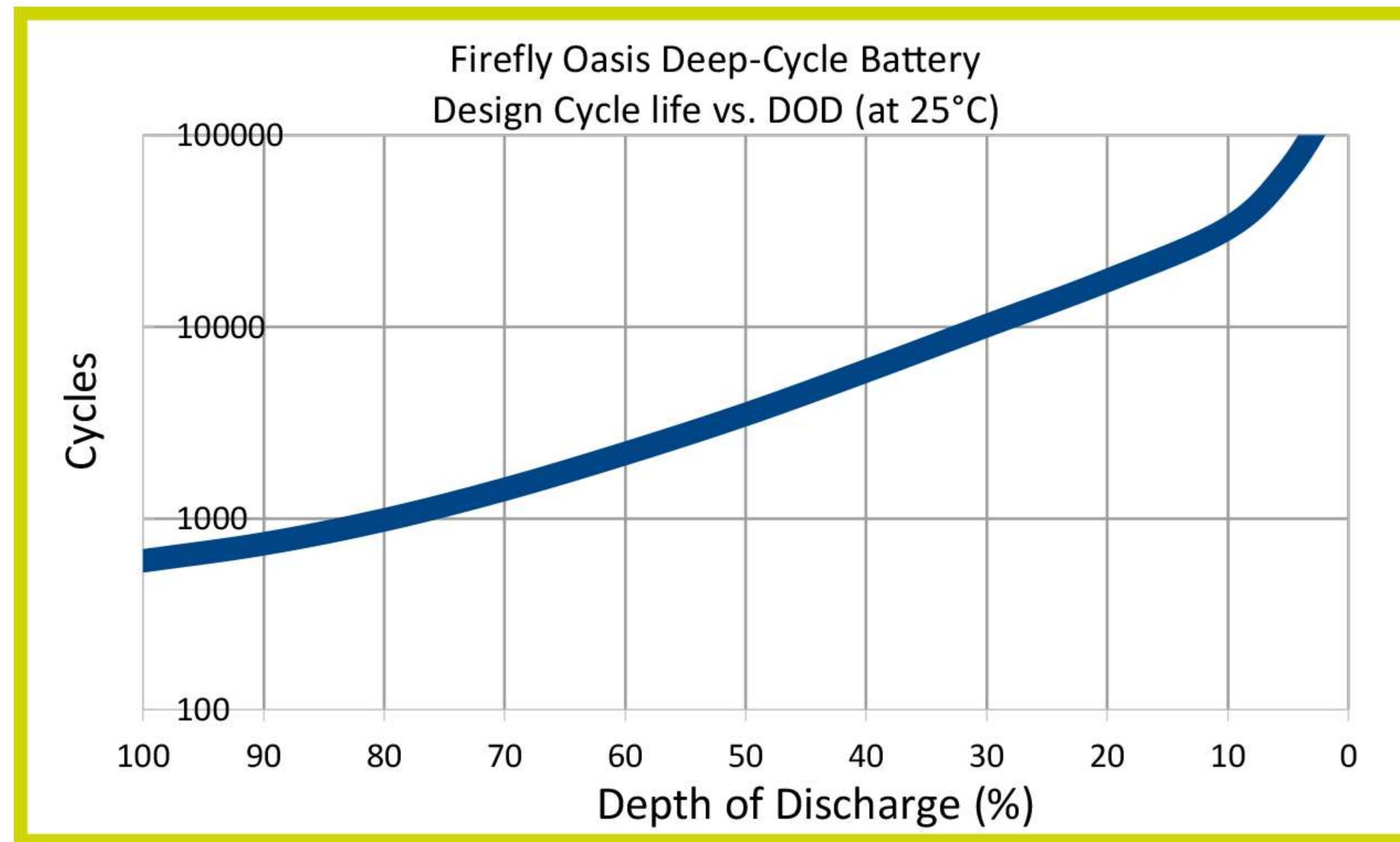
## PERFORMANCE TABLE

C Rate	Capacity Ah	Capacity %
C20	105	100.0%
C10	100	95.2%
C5	87	82.9%
C3	80	76.2%
C1	63	60.0%

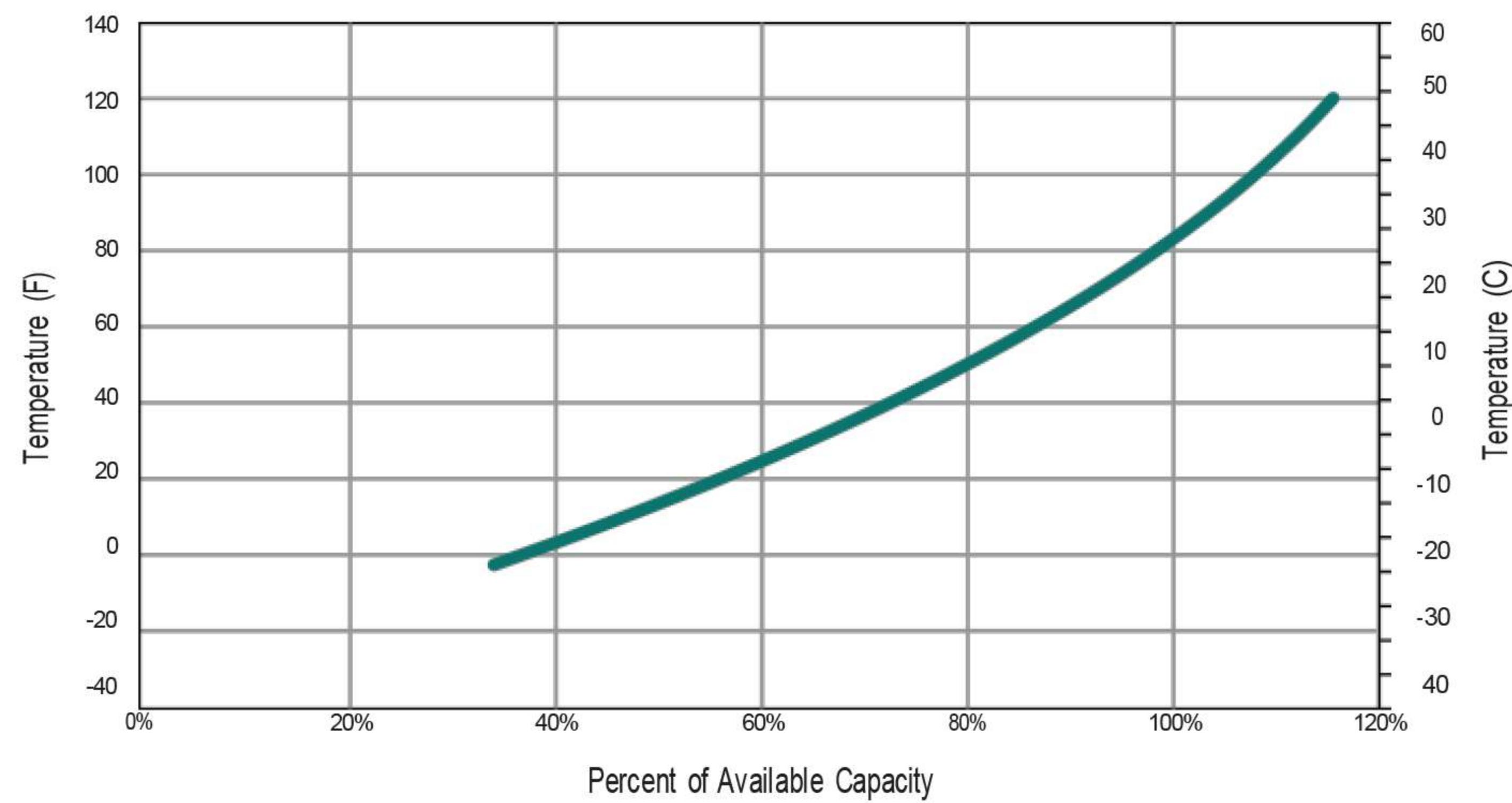
Model	Nominal Voltage (V)	Cap.@ 20H rate (AH)	Battery dimensions ( $\pm 2\text{mm}$ )			Weight ( $\pm 3\text{Kg}$ )		Acid (apprx.) L/cell	HRD Current	Max CHA current, (A) (Recommended)	IR (m $\Omega$ )
			L	W	H	Dry	Filled				
PD12D1-G31M	12	105	330	171	218	23.60	31.50	0.900	630	30	5.00

## DESIGN CYCLE VS DOD%

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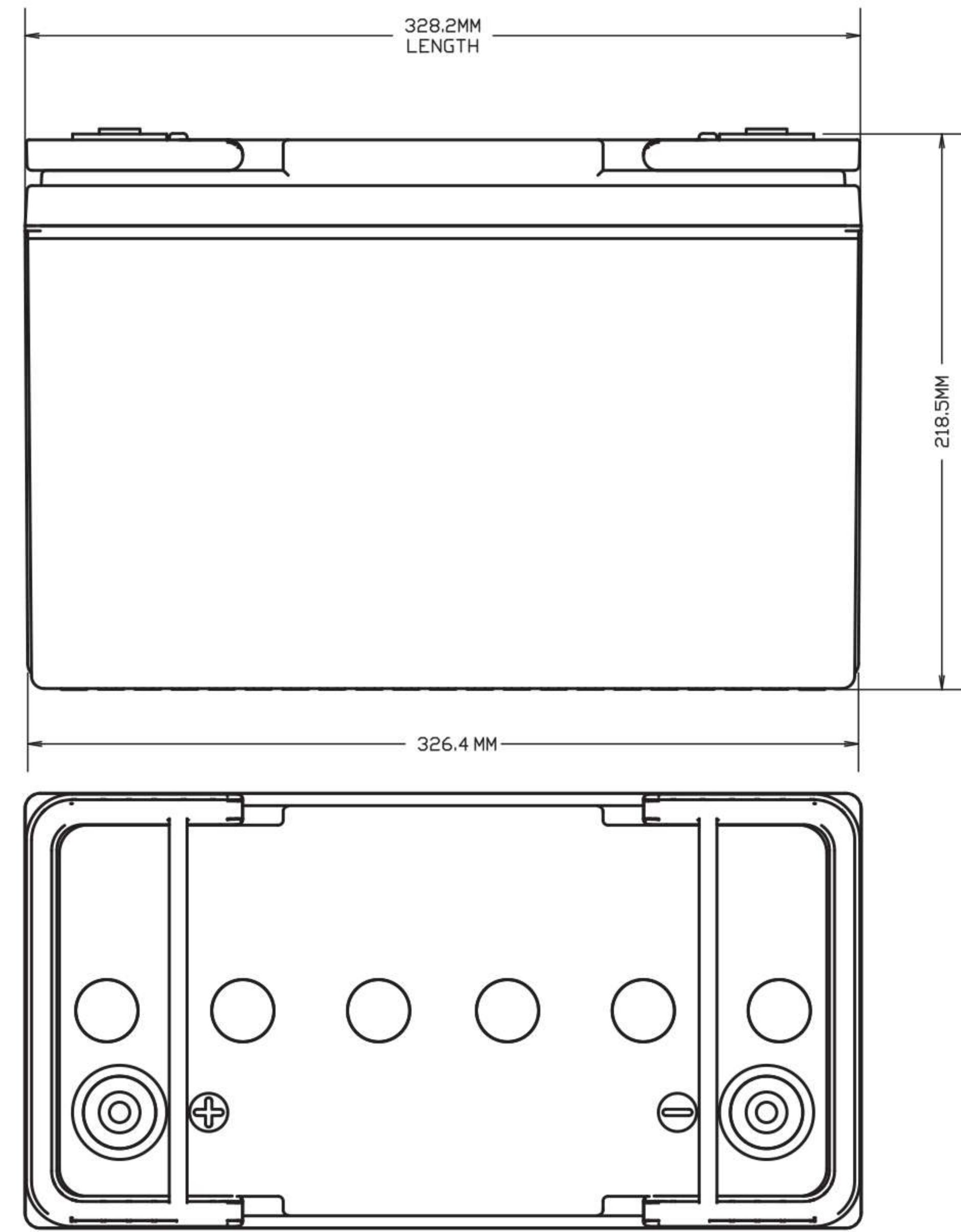


## PERCENT CAPACITY VS. TEMPERATURE



## PERFORMANCE TABLE

Capacity Test	Discharge Current Amps	Duration Minutes
C100	1	7200
C20	5.25	1200
C10	10.00	600
C5	17.40	300
C3	26.70	180
C1	63.00	60



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