



# Powering The Future



# 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.



OASIS™

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)

**OASIS™**

Partial state of charge Cycling Efficiency	Ampere-hour >97% & watt hour >90%
Nominal Voltage	12V
Maximum Charge Voltage	14.10V
Maximum Charge Current	0.5C Amps current limit for continuous charge @ 14.10V constant voltage charging 1C Amps can be tolerated for Sporadic session
Internal Resistance	5.0 Milli ohms ( Fully charged condition)
Shelf life@25°C(77°F)	2 years
Self- Discharge	<2% per Month
CCA	630 Amps

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

Weights & Dimensions	
Length	13.77 in/350 mm
Width	6.8 in/171 mm
Height	8.6 in/218 mm
Weight	69.5 lbs /31.5 kgs
Volume	Volume 760.2 Cu.in/12.3 liters



Construction	
Terminal Configuration	3/8" - 16UNC
Case/Cover	ABS
Racks	Available Upon Request
Bulk Charging	14.10 V / Battery
Absorption Charging	13.80 V / Battery
Float Charging	13.50 V / Battery
Current Limit	0.1C Amps to 0.5C Amps (max)

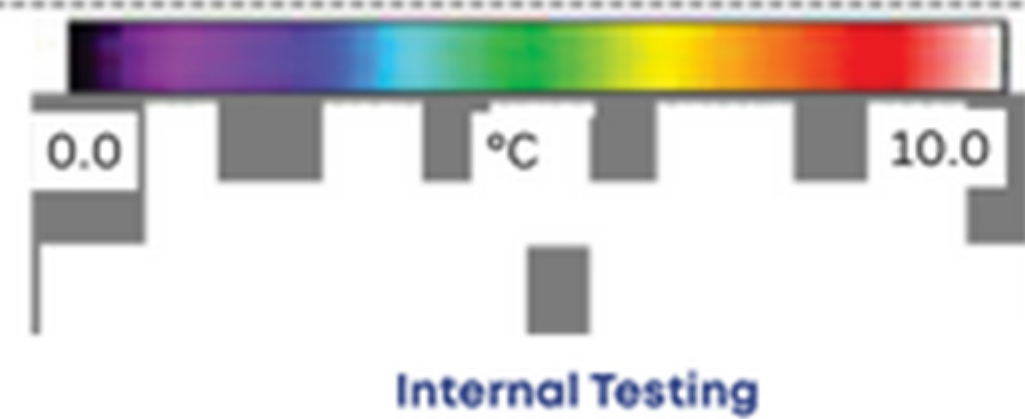
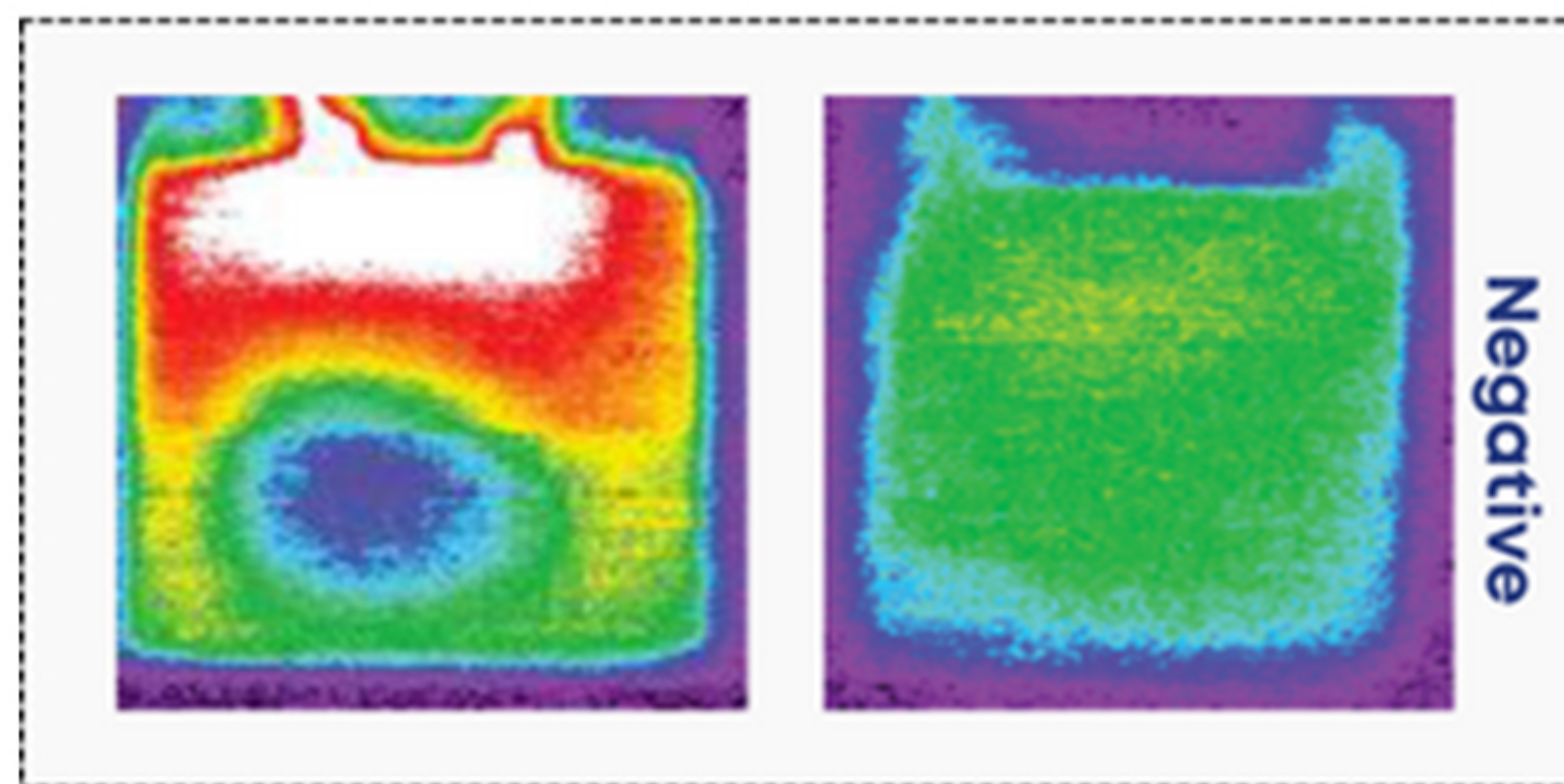
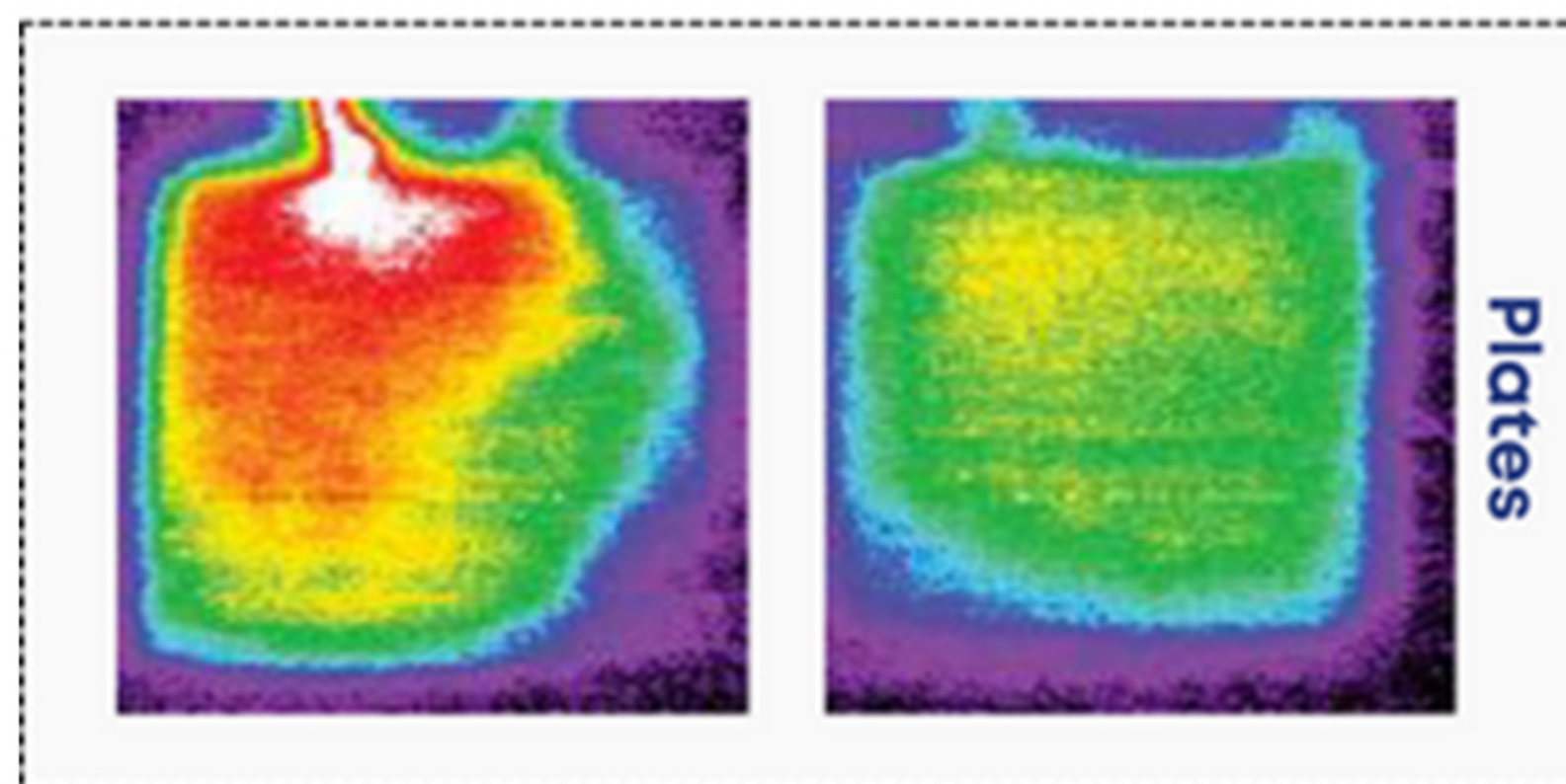
## International Compliance

IEC 60896 -21/22 :2004  
 IEC 61427  
 IS 15549:2005  
 ISO 9001:2008  
 IEC 60095  
 IEC 61056

Charge Temperature Compensation					
Operating Temperature	'C	-20	25	40	50
	°F	-4	77	104	122
Absorption Charge Voltage	v	15.6	14.4	14.1	13.9



Traditional Cell      Firefly Cell



Infrared thermal images snapped at the end of a 5C 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

**OASIS™**

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

## 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	WIDTH	HEIGHT	3/8 "	68.3 lbs (31 kgs.)	Plastic Handle	Horizontal and Vertical
		13.0 inch (330 mm)	6.73 inch (171 mm)	8.58 inch (218 mm)				

## ELECTRICAL SPECIFICATIONS

VOLTAGE	CRANKING PERFORMANCE		RESERVE 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.C.A. <sup>E</sup> @32°F	@ 25 Amp	1-Hr	5-Hr	10-Hr	20-Hr	5.00 (max)	2625 (max)
	630	756	210	63	87	100	105		

## CHARGING INSTRUCTIONS

### 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>Bulk Voltage (2.35 V/cell)</b>	14.10	28.20	52.30	56.40
<b>Absorption Voltage (2.30 V/cell)</b>	13.80	27.60	41.40	55.20
<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

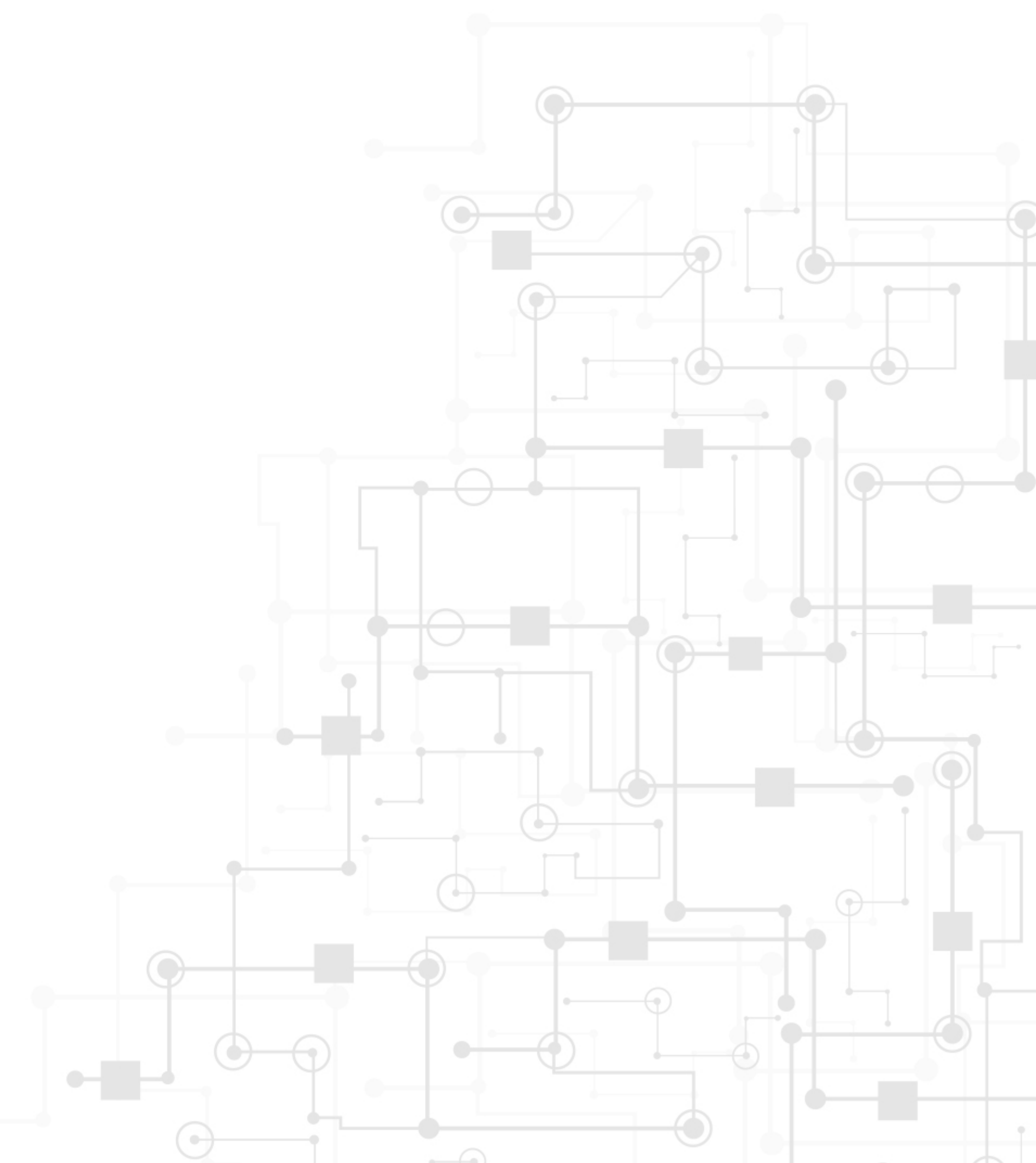
ADD	SUBTRACT
0.005 volt per cell for every 1°C below 25°C 0.0028 volt per cell for every 1°F below 77°F	0.005 volt per cell for every 1°C above 25°C 0.0028 volt per cell for every 1°F above 77°F

## OPERATIONAL DATA

OPERATING TEMPERATURE	SELF DISCHARGE
-20°C/4°F to 50°C/122°F At temperatures below 32°F (0°C) maintain a state of charge greater than 60%.	Less than 2% per month @20°C depending on storage temperature conditions will increase or decrease self discharge %

## 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

**3/8 X 1/2 inches**

**Battery Height with Terminal in Inches (mm)**  
8.58 inch (218 mm)

**Torque Values in-lb (Nm)**  
Bolt: 85 - 90 (10 - 11)

## RECYCLE RESPONSIBLY



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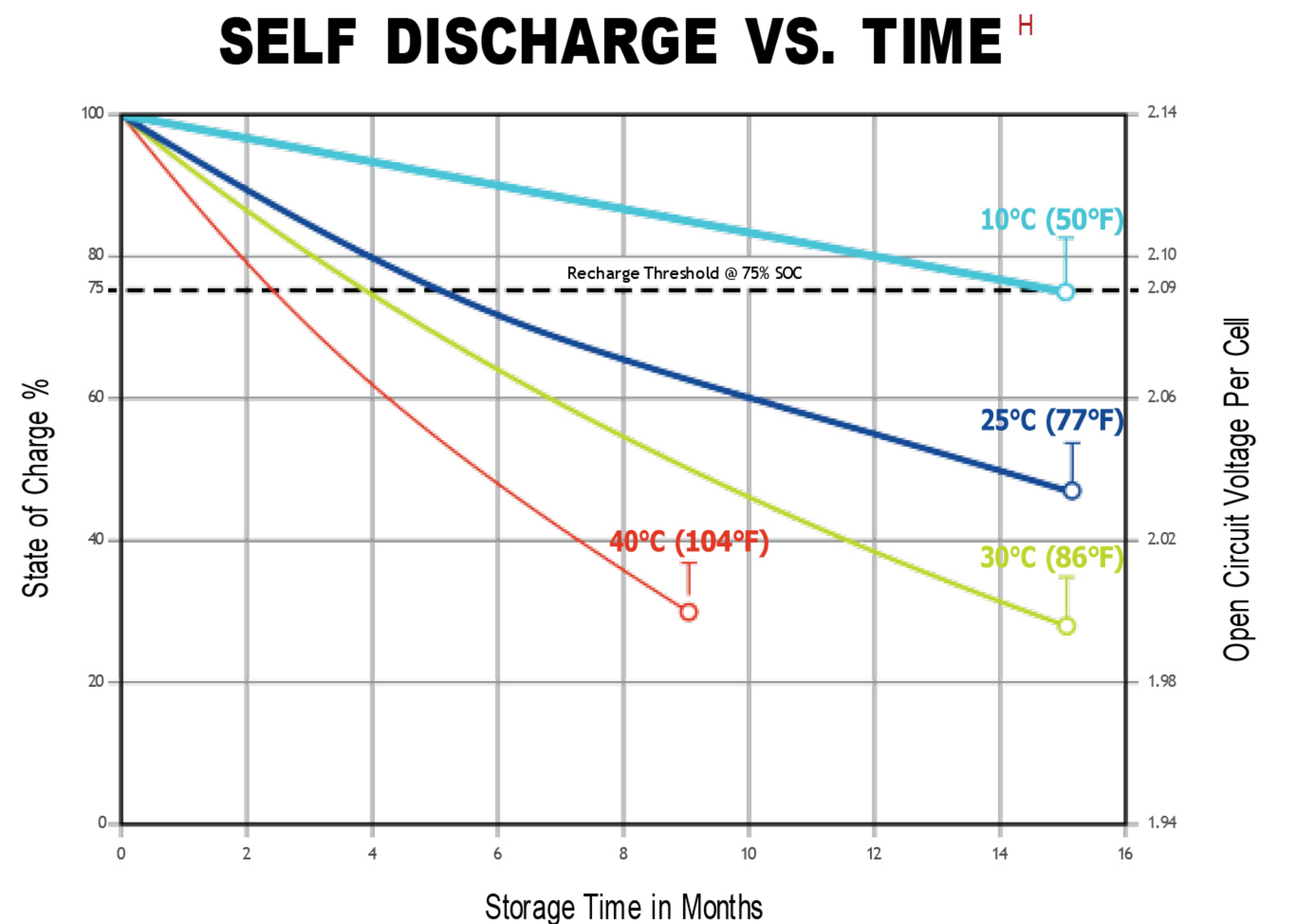
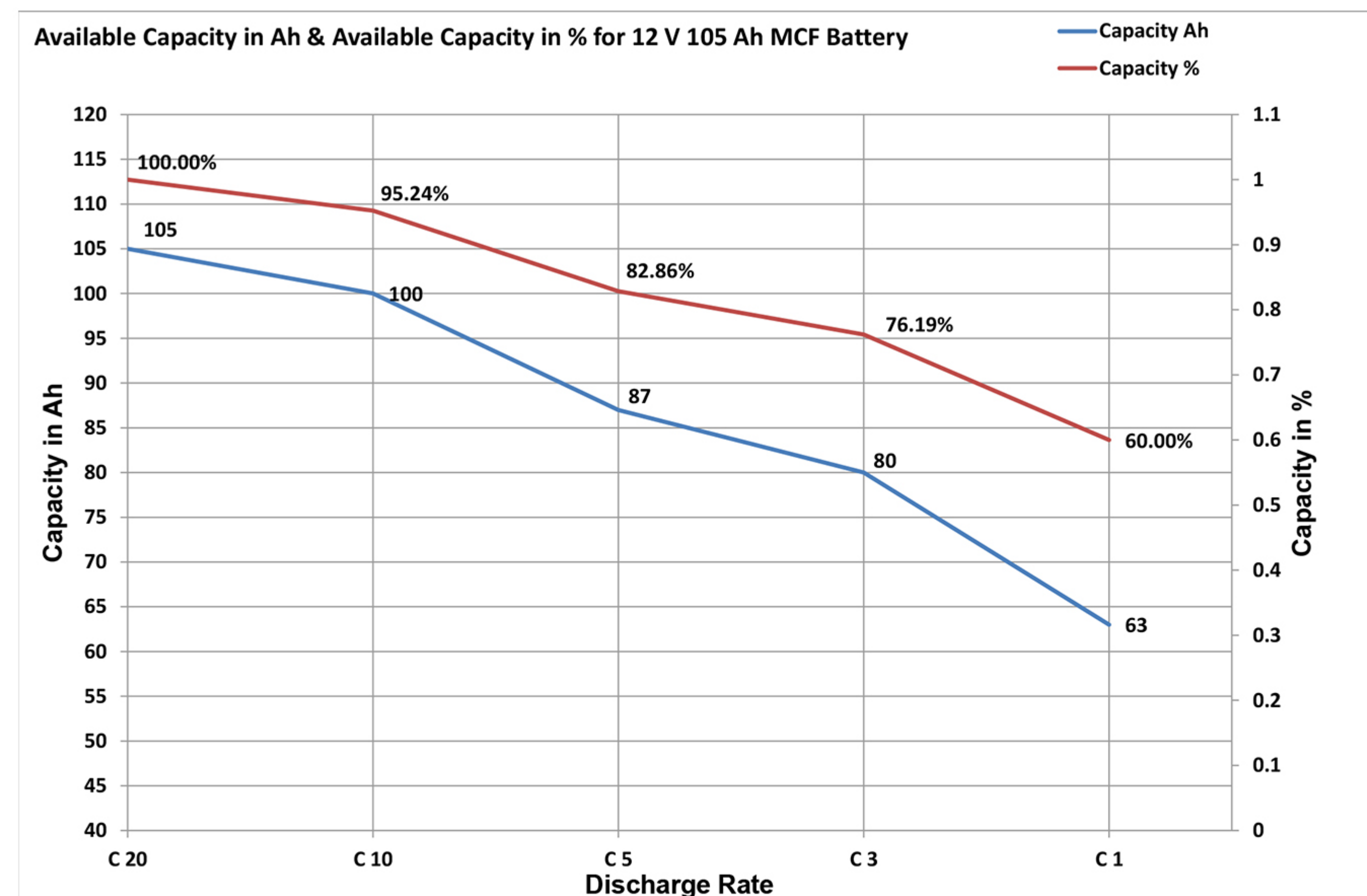
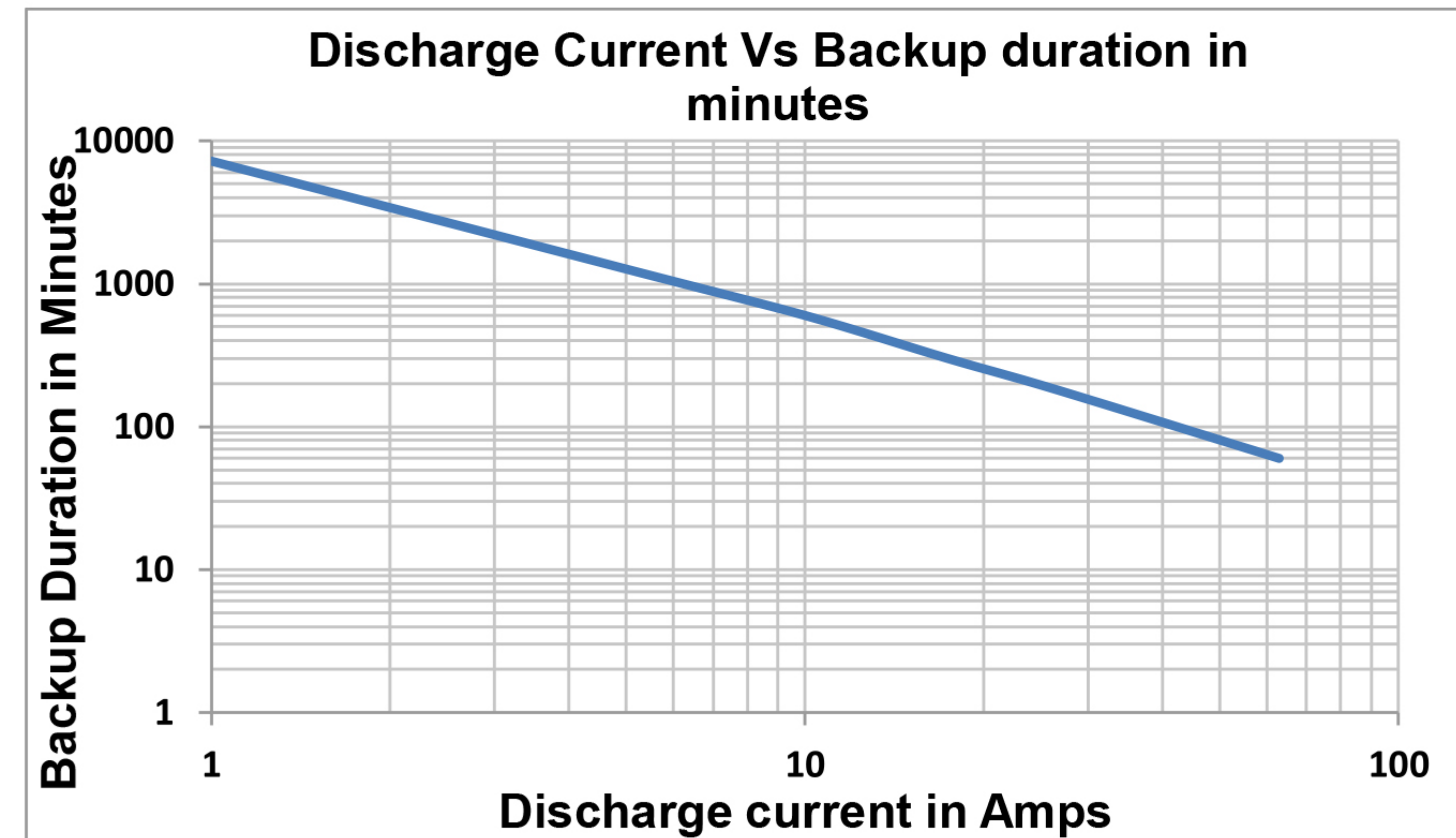
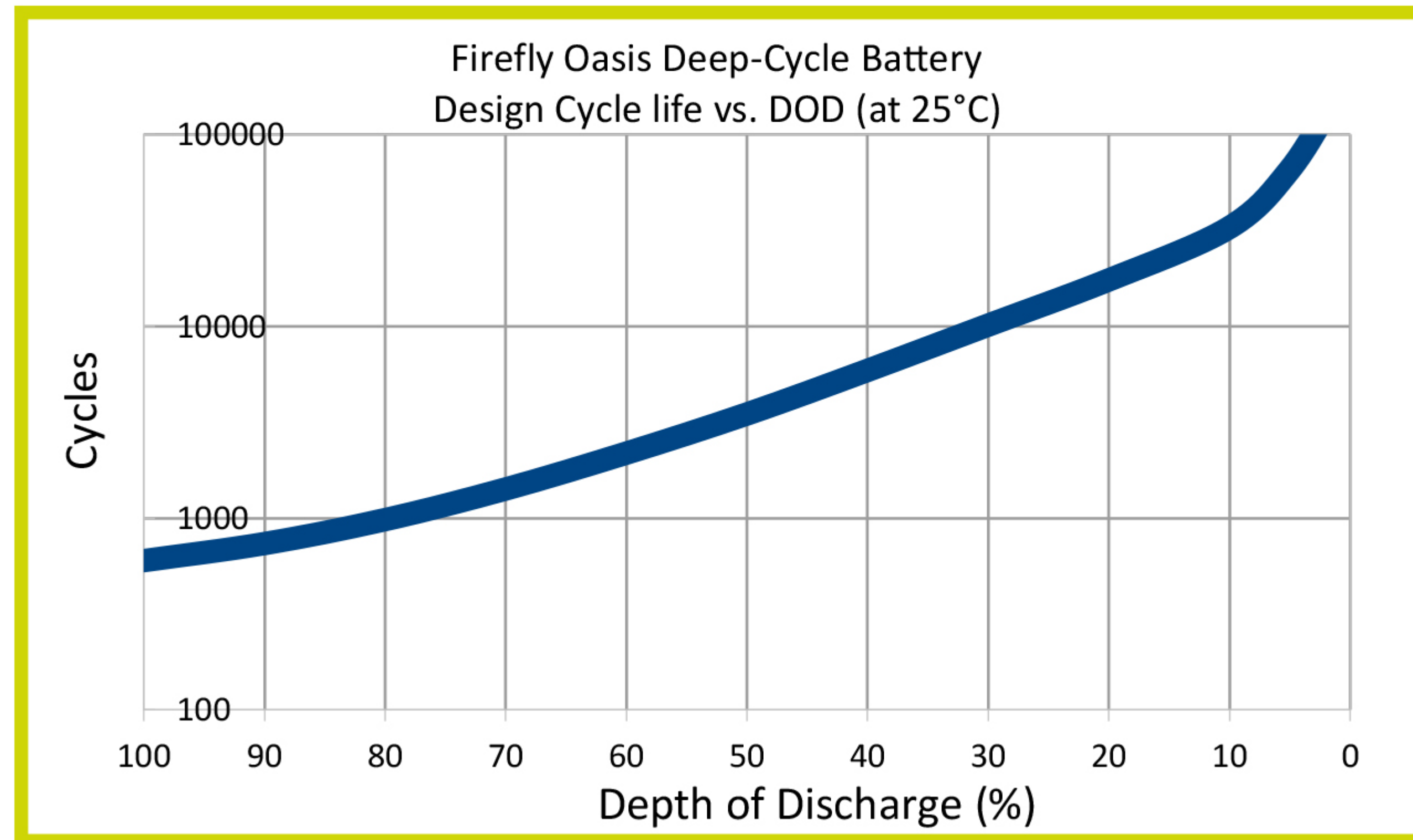
## PERFORMANCE TABLE

C Rate	Capacity Ah	Capacity %	Current Voltage
C20	105	100.0%	10.50V
C10	100	95.2%	10.50V
C5	87	82.9%	10.50V
C3	80	76.2%	10.50V
C1	63	60.0%	10.50V

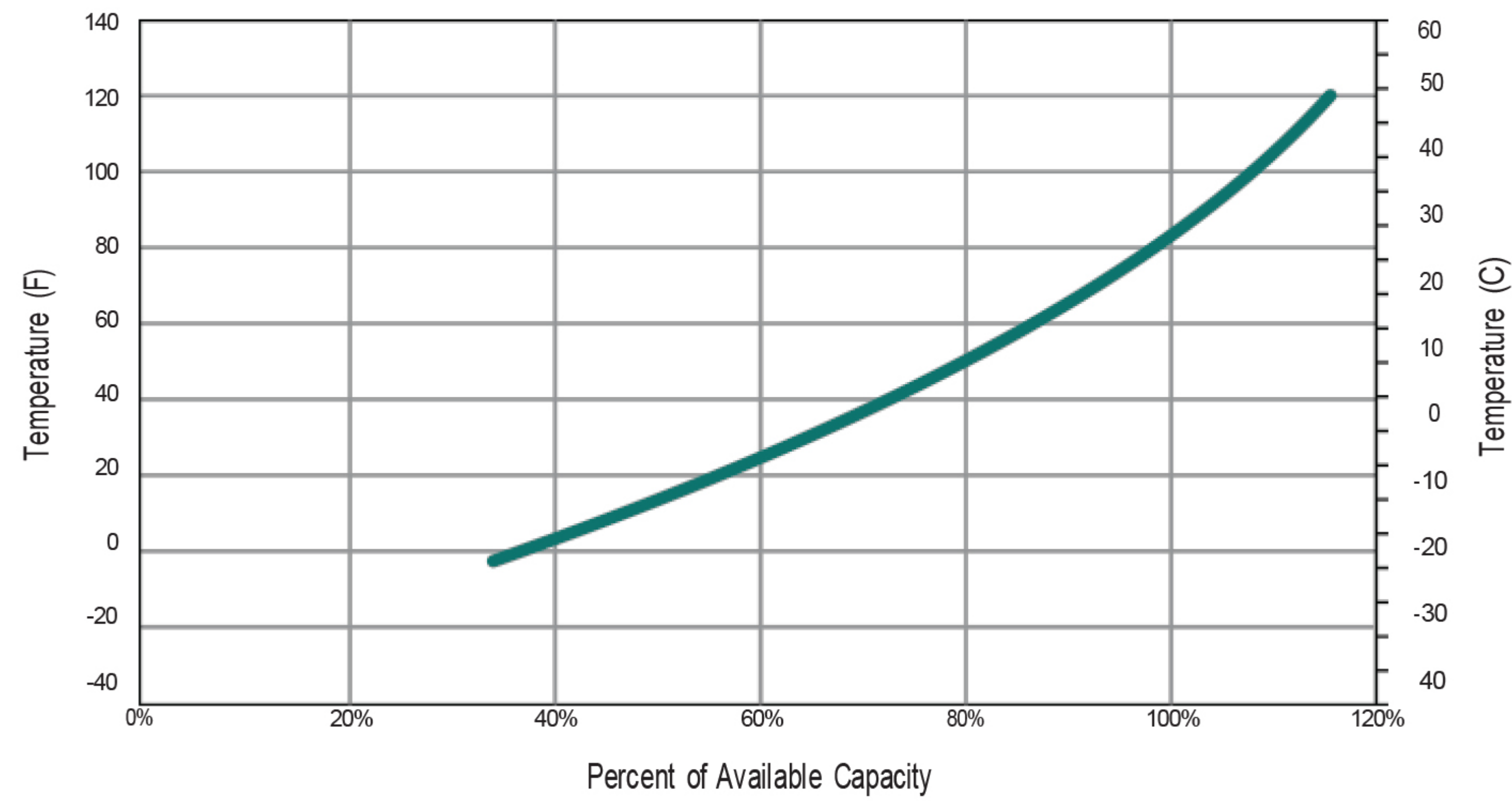
Model	Nominal Voltage (V)	Cap.@ 20H rate (AH)	Battery dimensions (± 2mm)			Weight (±3Kg)		HRD Current	Max CHA current, (A)	Internal Resistance mΩ Fully Charged (Recommended)
			L	W	H	Dry	Filled			
PD12D1-G31M	12	105	330	171	218	23.60	31.50	630	50 A	5.00
PD12D1-G31M	12	105	350	171	218	23.60	31.50	630	50 A	5.00



# DESIGN CYCLE VS DOD%

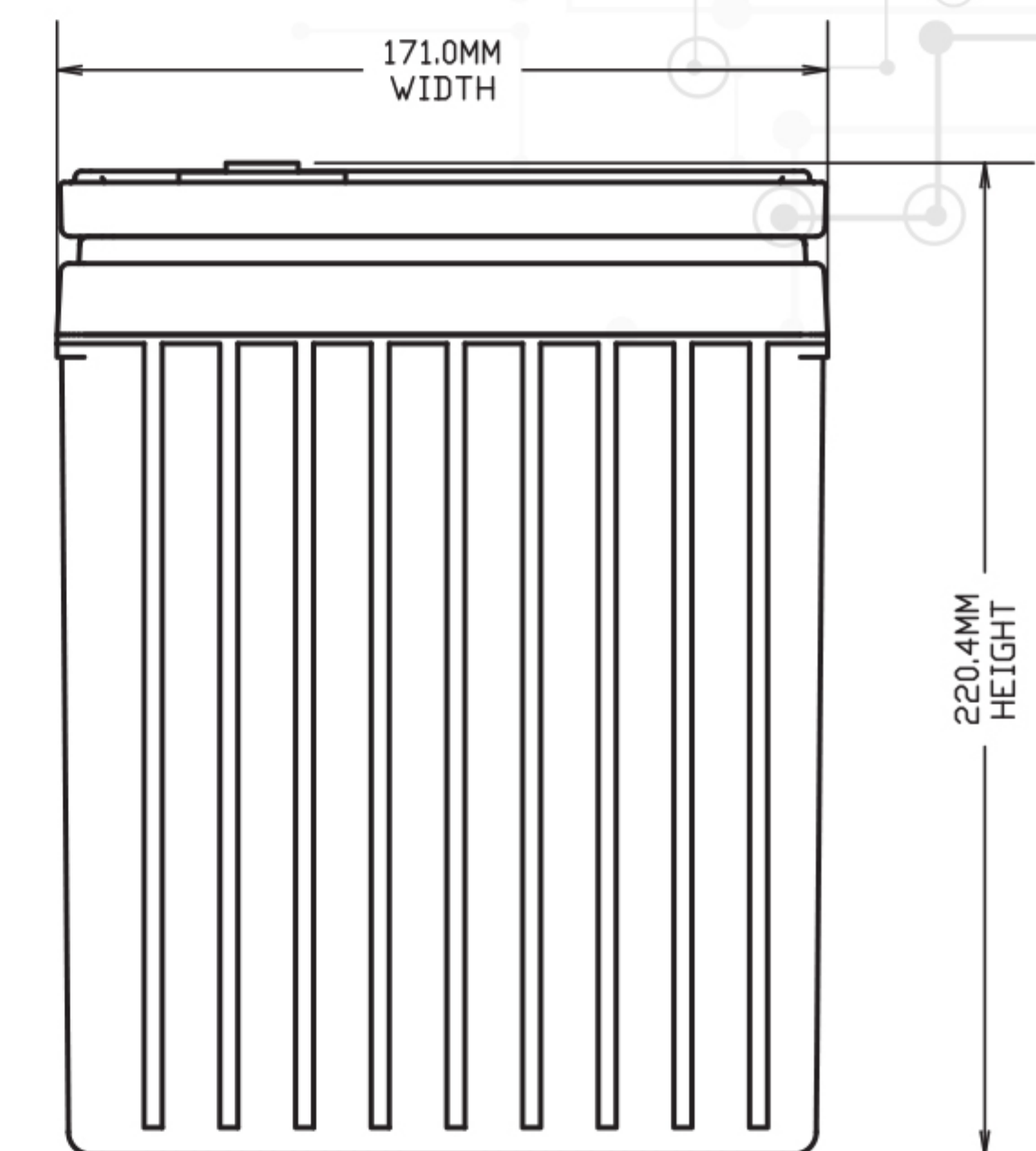
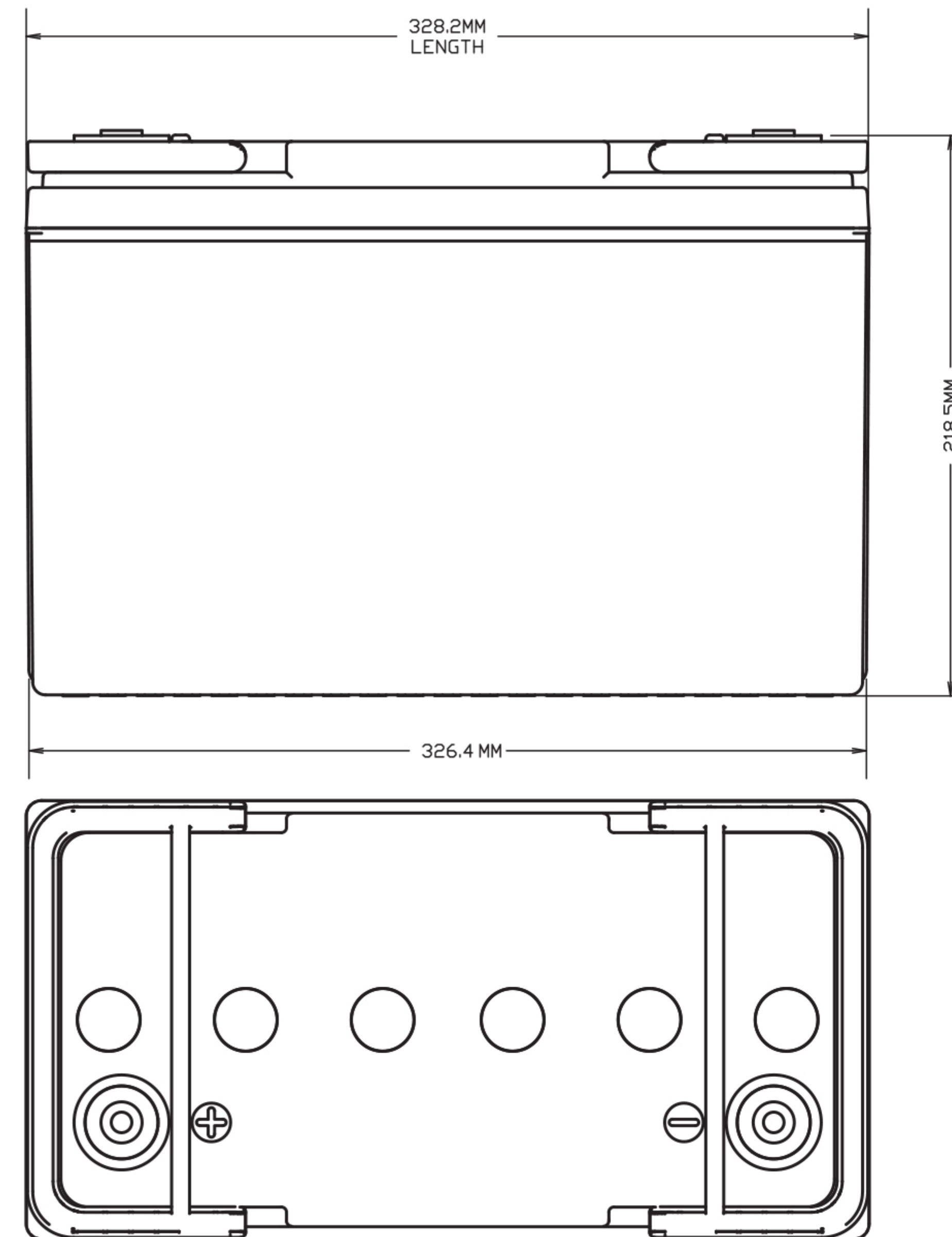


## PERCENT CAPACITY VS. TEMPERATURE



## PERFORMANCE TABLE

Capacity Test	Discharge Current Amps	Duration Minutes	Duration Minutes
C20	5.25	1200	10.50V
C10	10.00	600	10.50V
C5	17.40	300	10.50V
C3	26.70	180	10.50V
C1	63.00	60	10.50V



# OASIS<sup>TM</sup>



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