

# EPSILON

# Powering the Future

## VRLA Maintenance Free Batteries



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### C- VIGOR™ UPS BATTERY

Major industrial location often have critical processes that cannot be shut down and any power failure can cost them millions of dollars due to loss of production and rebooting of the process.

Firefly Batteries are produced in the state of art battery manufacturing facility at Bavla near Ahmedabad, Gujarat, using advanced AGM-VRLA technology. These batteries have long float and cyclic life span, high specific energy and low self-discharge rate.

They are completely leak proof, have excellent anti-corrosion properties and gives superlative performance across its designed temperature range of -20°C to 50°C without any slide in performance.

Firefly's Epsilon batteries resolve six most common power backup issues faced by the users. These are: Power failure, Power snags, Power surges, Over voltage, Frequency variation and Switching transients.

Firefly provides solutions for Energy Storage, Power Backup and Alternative Energy Applications.

Firefly makes world class VRLA-AGM batteries. These are completely maintenance free and matches the global standards. The need for reliable power in our world today is growing every day and to meet this growing requirement we at Firefly render world class battery solutions for UPS ,Data Centers, Server Rooms, Network Wiring, Back Office and Medical Equipment.

Data centers depends on UPS to protect their critical business processes and ensure reliability even in disaster scenarios.

- UPS Systems.
- Office Automation Equipment.
- EPABX Systems.
- Fire Alarm and Security Systems.
- Telecommunication Systems.
- Network Operations Systems.
- Internet Housing Sites.

APPLICATION

- Maintenance Free VRLA AGM technology, no topping up ever.
- Designed for long life.
- Capable for deep cycling.
- Ready to use- factory charged batteries.
- Eco Friendly- clean and safe environment.
- Low self discharge.
- Excellent charge acceptance and charge retention.
- Superior high rate discharge.

FEATURES

## Storage instructions

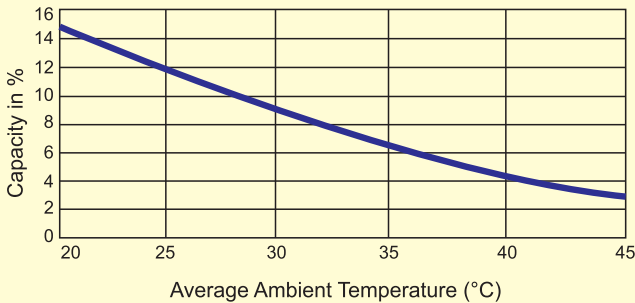
During storage, batteries gradually lose their capacity due to self discharge. Firefly battery self discharge rate is very low, typically < 2.0% per month at 27°C. It is recommended that specific precaution should be taken to prevent the battery from over self discharging when it is stored.

- Batteries should be stored in a cool and dry place. They should not be exposed to sunshine, heat and heat generating units.
- Recommended storage temperature is -20°C to 40°C.
- Humidity should be as low as possible.

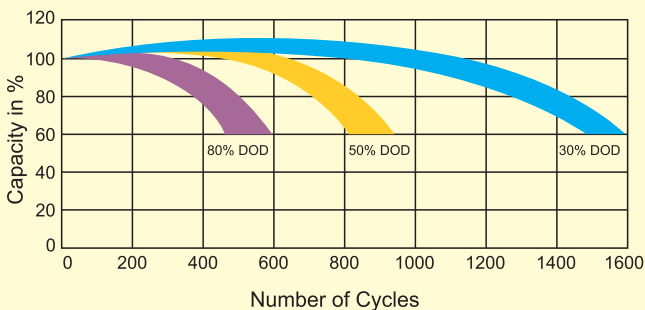
## Battery Life

Battery cyclic life is dependent on the depth of discharge that the battery experience during each cycle. Various number of cycles related to the depth of discharge is shown in the graph.

Float Life vs. Average Ambient Temperature



Depth of Discharge Vs. Number of Cycles at 27°C

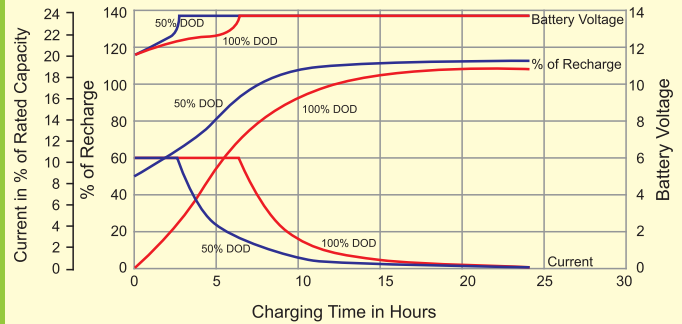


## Charging Characteristics

Constant voltage charging is recommended for Firefly batteries. The Charging characteristics are shown in the graph.

CHARGING VOLTAGE SETTING AT 27°C			TEMPERATURE COMPENSATION
Mode of Operation	Charging voltage	Charging Current in Amps.	Ambient temperature above 27°C: Subtract 18mV/°C/Battery on the recommended charging voltage at 27°C
Float	13.50 ± 0.05 Volts	10% to 30% of rated capacity	Ambient temperature below 27°C: Add 18mV/°C/Battery on the recommended charging voltage at 27°C
Boost	14.20 ± 0.05 Volts	10% to 30% of rated capacity	

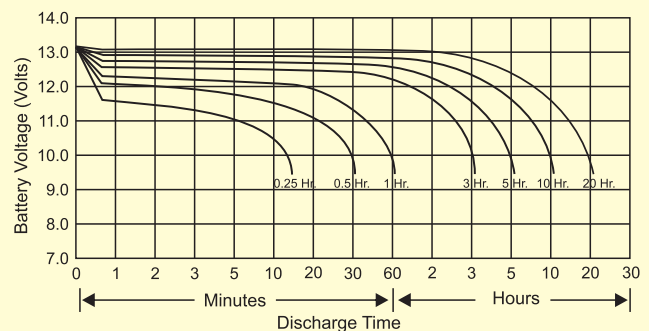
Charge Characteristics - Float Use



## Battery Discharging

The capacity of Firefly battery is the amount of electrical energy that can be obtained from full charged battery. Capacity is expressed in Ampere Hours (AH). The capacity value is dependent on the discharge current, temperature and the final cut off voltage.

Discharge Performance Curve at Various Rates @ 27°C



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## Discharge Current at Various Duration

Battery Type	Nominal Voltage	Rated Capacity in 20 hour @ 27°C	Battery Dimension (±3 mm)				Weight in Kg. (±5%)	Constant Current Discharge Rating- Amperes to 10.50 V per Battery at 27°C									Terminal Type	Casing Material
			Length (L)	Width (W)	Height (H)			10 Minute	15 Minute	30 Minute	60 Minute	2 Hours	3 Hours	5 Hours	10 Hours	20 Hours		
C-VIGOR™ 18	12	18	182	77	172	6.2	35.6	28.1	16.9	10.8	6.2	4.4	3.0	1.6	0.9	M5 x 6 mm (Tin coated brass)	ABS	
C-VIGOR™ 24	12	24	182	77	172	7.0	47.5	37.4	22.6	14.4	8.3	5.9	4.0	2.2	1.2	M5 x 6 mm (Tin coated brass)	ABS	
C-VIGOR™ 26	12	26	167	127	175	9.0	51.5	40.6	24.4	15.6	9.0	6.4	4.3	2.4	1.3	L- Terminal	ABS	
C-VIGOR™ 42	12	42	206	172	182	14.8	83.1	65.5	39.5	25.2	14.5	10.4	7.0	3.8	2.1	L- Terminal	PPCP	
C-VIGOR™ 65	12	65	356	172	182	21.0	128.7	101.4	61.1	39.0	22.4	16.0	10.9	5.9	3.3	L- Terminal	PPCP	
C-VIGOR™ 75	12	75	356	172	182	23.5	148.5	117.0	70.5	45.0	25.9	18.5	12.5	6.8	3.8	L- Terminal	PPCP	
C-VIGOR™ 80	12	80	342	173	248	28.5	158.4	124.8	75.2	48.0	27.6	19.7	13.4	7.3	4.0	ANSI 3/8- 16 (Tin coated brass)	PPCP	
C-VIGOR™ 100	12	100	342	173	248	33.5	198.0	156.0	94.0	60.0	34.5	24.7	16.7	9.1	5.0	ANSI 3/8- 16 (Tin coated brass)	PPCP	

## Capacity at Various Rates of Discharge

Battery Type	Normal Voltage	Rated Capacity in 20 hour @ 27°C	Capacity AH at various rates of discharge to 1to 10.50 V per Battery at 27°C								
			10 Minute	15 Minute	30 Minute	60 Minute	2 Hours	3 Hours	5 Hours	10 Hours	20 Hours
C-VIGOR™ 18	12	18	6	7	8	11	12	13	15	16	18
C-VIGOR™ 24	12	24	8	9	11	14	17	18	20	22	24
C-VIGOR™ 26	12	26	9	10	12	16	18	19	22	24	26
C-VIGOR™ 42	12	42	14	16	20	25	29	31	35	38	42
C-VIGOR™ 65	12	65	22	25	31	39	45	48	54	59	65
C-VIGOR™ 75	12	75	25	29	35	45	52	56	63	68	75
C-VIGOR™ 80	12	80	27	31	38	48	55	59	67	73	80
C-VIGOR™ 100	12	100	33	39	47	60	69	74	84	91	100

**Maintenance Free**  
No topping up in life time



**Ready to Use**  
Filled and Factory Charged



**Low Cost of Ownership**  
Designed for long life



### Do's

- Always store Firefly batteries in cool and protected areas.
- Always read the Battery operating guidelines in the warranty card before installation.
- Always Keep the battery away from sparks and heat.
- Charge the battery once in 3 months, in case battery is kept unused or ideal.
- In case of battery being damaged, stop installation.
- Clean the batteries with dry cloth in case of dust accumulation.
- See instruction for Charging parameters.

### Dont's

- Firefly VRLA batteries are sealed batteries, hence, do not add any acid or DM water.
- Do not tamper the vent plugs.
- Make sure not to over tight / under tight the terminal bolts, this will cause terminal breakage.
- Make sure not to mix different capacities, different make and different types of batteries.
- Make sure not to use under rating cables for connecting the batteries.
- Provide sufficient ventilation for air circulation.
- Batteries should not be kept in ideal condition for more than 12 hours.

## Firefly Batteries Private Limited

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