

6-EVF-70T

12V 70Ah(3hr) VRLA GEL BATTERY



Chilwee EVF Series VRLA Gel Battery is specially designed for electric vehicles, i.e. electric automobiles, electric road vehicles, golf cart, low speed electric cart, etc. and other devices require DC power source. The EVF Series adopts international leading technologies to ensure the batteries with features of long cycle life, large current discharge capability, high reliability and safety, and environmental-friendly.

FEATURES

Extra Long Life: Chilwee EVF Series are designed with high quality grid alloy enables the grid with features of anti-corrosion, low gas emission and excellent deep cycle performance, as well as high density and special deep cycle lead paste prescription is adopted to ensure extra long cycle life. The cycle life may reach 600+ cycles @ 80% DOD.

High Capacity and High Energy Density: Chilwee EVF Series are designed with adequate active material and higher electrolyte density to increase the battery's capacity within certain dimension and weight, so as to keep the battery with high energy density to be compatible with most of the electric vehicle without providing extra space to install batteries.

High Reliability and Safety: High strength ABS battery container and lid, perfect safety valve design, and high strength & excellent large current electroconductivity copper terminal design are adopted to ensure the Chilwee EVF Series with high reliability and safety at extreme condition.

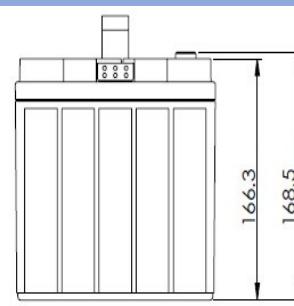
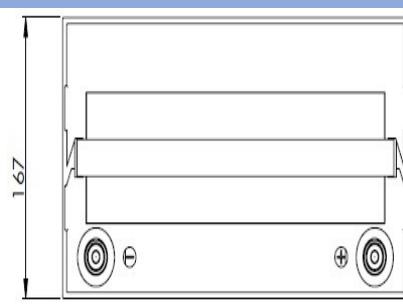
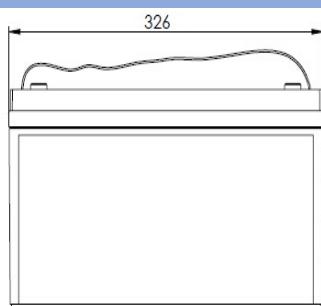
High Environmental Adaptability: Chilwee EVF Series adopts special fumed silica Gel in electrolyte and special Gel type separator to prevent electrolyte stratification. This can significantly improve the battery's service life and environmental adaptability.

Non-Cadmium Design, Environment-friendly: Chilwee Battery has adopted internationally leading technology - container formation non-cadmium production technology, which is in the leading position in the industry. It helps to save energy 28.5%, save water 90%, and non-discharge of waste water.

SPECIFICATION

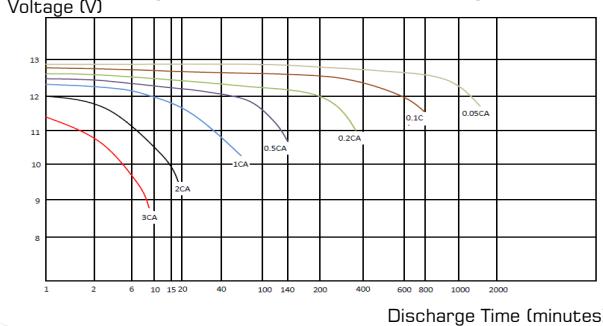
Nominal Voltage (V)		12V
Open Circuit Voltage (V/Block)		12.8V - 13.4V
Number of Cells (Per Block)		6 Cells
Rated Capacity (Ah, 25°C)	2h rate (to 1.75V/Cell)	62Ah
	3h rate (to 1.75V/Cell)	70Ah
	5h rate (to 1.80V/Cell)	75Ah
	10h rate (to 1.85V/Cell)	90Ah
	20h rate (to 1.85V/Cell)	95Ah
Nominal Weight (Kgs)		Approx. 26Kgs
Dimension (L X W X H, Total Height. mm)		(326mm±3) X (167mm±3) X (166mm±3), (169mm±3)
Container Material		Enhanced ABS
Charge Voltage	Float (V/Block)	13.80V
	Cycle (V/Block)	14.65V - 14.75V
Maximum Discharge Current (A)		350A (5s)
Maximum Charge Current (A)		12A

DIMENSION

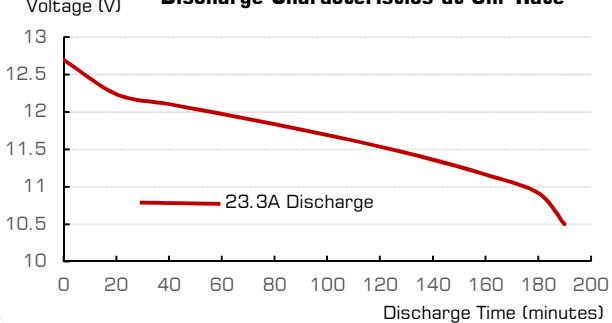


TECHNICAL CURVES

Discharge Curves at Different Discharge Rate (25°C)

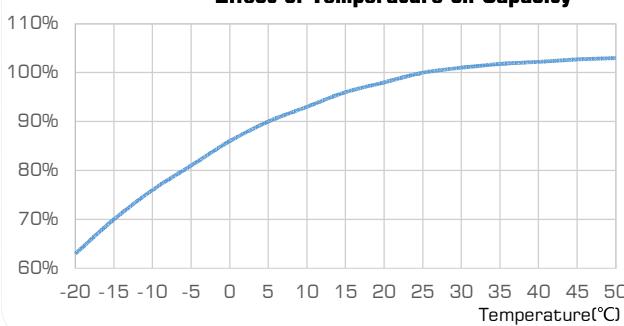


Discharge Characteristics at 3hr Rate



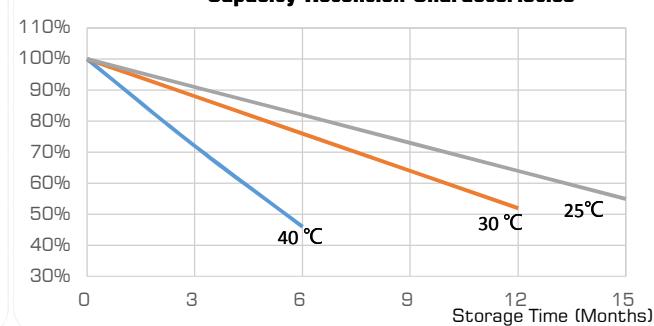
Capacity (%)

Effect of Temperature on Capacity



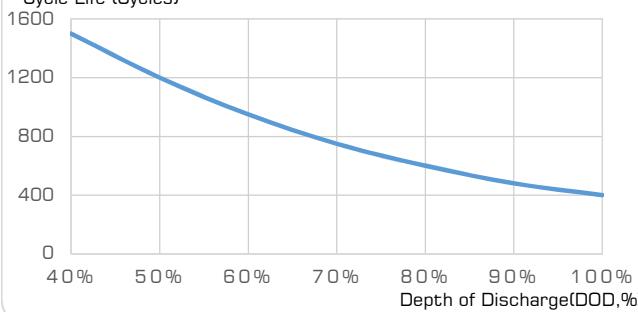
Capacity (%)

Capacity Retention Characteristics



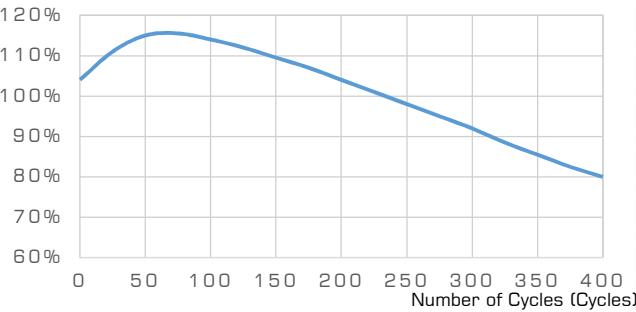
Cycle Life (Cycles)

Cycle Life vs. Depth of Discharge



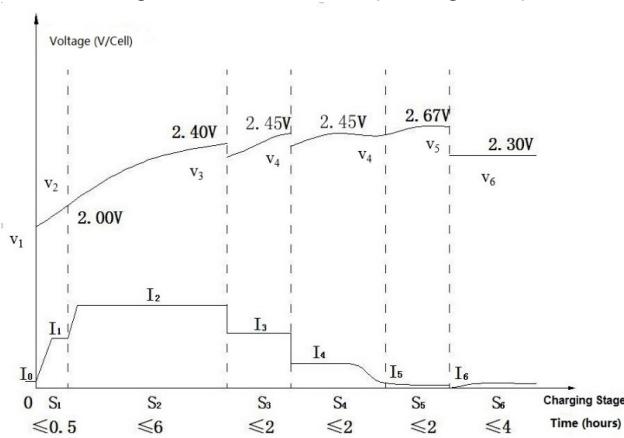
Capacity (%)

Number of Cycles vs. Capacity



CHARGE CURVE & METHOD

Charge Curve for 6-EVF-70T (for Single Cell)



Charge Method

- Pre-charge Stage:** When the battery is connected to the charger, the charger shall detect the voltage of the battery. For the battery's voltage at between V_1 - V_2 or the battery pack is pre-charged at a current between I_0 - I_1 . When the battery's voltage reaches V_2 or the charge time reaches S_1 , the charge enters into next stage. Parameters refer to Table 1, Appendix.
- Constant Current Charge Stage:** Charge current is I_2 ; When the charge voltage reaches V_3 or the charge time reaches S_2 , the charge enters into next stage. Parameters refer to Table 2, Appendix.
- Constant Current Charge Stage:** Charge current is I_3 ; When the maximum voltage reaches V_4 or the charge time reaches S_3 , the charge enters into next stage. Parameters refer to Table 3, Appendix.
- Constant Voltage Limited Current Charge Stage:** The constant charge voltage is V_4 , limited current is I_4 . When the charge current drops to the lower limit value of I_4 as Table 4 shown, or the charge time reaches S_4 , the charge enters into next stage. Parameters refer to Table 4, Appendix.
- Trickle Charge Stage:** When the charge time S_2 is less than 3 hours, trickle charge is not activated. Otherwise the limited voltage is V_5 the constant current is I_5 or the charge time reaches S_5 , the charge enters into next stage. Parameters refer to Table 5, Appendix.
- Float Charge Stage:** Constant voltage is V_6 , limited current is I_6 . The charger shall be cut off while the charge time is within 4 hours. Parameters refer to Table 6, Appendix.

APPENDIX II: CHARGE PARAMETERS FOR EVF SERIES
Table 1 - Parameters for Pre-charge Stage

Battery Model	Voltage Range: V ₁ - V ₂ (V per Block)	Constant Current: I ₀ ~ I ₁ (A)	Pre-Charge Time: S ₁ (h)	Temperature Compensation (V/°C)
3-EVF-180A	3.0V - 6.0V	3.1A - 18.0A	≤ 0.5h	
3-EVF-200A / 3-EVF-200T				
4-EVF-150A/4-EVF-150		2.2A - 14.0A		
6-EVF-60		2.0A - 6.0A		
6-EVF-70T		2.0A - 7.0A		
6-EVF-80		2.0A - 8.0A		
6-EVF-100A / 6-EVF-100T		2.5A - 10.0A		
6-EVF-110T		2.5A - 11.0A		
6-EVF-120		2.5A - 12.0A		
6-EVF-150A / 6-EVF-150T		2.5A - 15.0A		

Table 2 - Parameters for Constant Current Charge Stage

Battery Model	Voltage Range: V ₃ (V per Block)	Constant Current: I ₂ (A)	Charge Time: S ₂ (h)	Temperature Compensation (V/°C)
3-EVF-180A	7.2V	30.0A	≤ 6h	-0.012
3-EVF-200A / 3-EVF-200T				
4-EVF-150A/4-EVF-150		25.0A		-0.016
6-EVF-60		10.0A		-0.024
6-EVF-70T		12.0A		-0.024
6-EVF-80		14.0A		-0.024
6-EVF-100A / 6-EVF-100T		15.0A		-0.024
6-EVF-110T		20.0A		-0.024
6-EVF-120		20.0A		-0.024
6-EVF-150A / 6-EVF-150T		25.0A		-0.024

Table 3 - Parameters for Constant Current Charge Stage

Battery Model	Voltage Range: V ₄ (V per Block)	Constant Current: I ₃ (A)	Charge Time: S ₃ (h)	Temperature Compensation (V/°C)
3-EVF-180A	7.35V	30.0A	≤ 2h	-0.012
3-EVF-200A / 3-EVF-200T				
4-EVF-150A/4-EVF-150		25.0A		-0.016
6-EVF-60		10.0A		-0.024
6-EVF-70T		12.0A		-0.024
6-EVF-80		14.0A		-0.024
6-EVF-100A / 6-EVF-100T		15.0A		-0.024
6-EVF-110T		20.0A		-0.024
6-EVF-120		20.0A		-0.024
6-EVF-150A / 6-EVF-150T		25.0A		-0.024

Table 4 - Parameters for Constant Voltage Limited Current Charge Stage

Battery Model	Voltage Range: V ₄ (V per Block)	Limited Current: I ₄ (A)	Charge Time: S ₄ (h)	Temperature Compensation (V/°C)
3-EVF-180A	7.35V	10.0A - 3.2A	≤ 2h	-0.012
3-EVF-200A / 3-EVF-200T		10.0A - 3.6A		-0.012
4-EVF-150A/4-EVF-150		7.5A - 2.7A		-0.016
6-EVF-60		3.0A - 1.1A		-0.024
6-EVF-70T		3.5A - 1.3A		-0.024
6-EVF-80		4.0A - 1.5A		-0.024
6-EVF-100A / 6-EVF-100T		5.0A - 1.8A		-0.024
6-EVF-110T		6.0A - 2.0A		-0.024
6-EVF-120		6.0A - 2.2A		-0.024
6-EVF-150A / 6-EVF-150T		7.5A - 2.7A		-0.024

Table 5 - Parameters for Trickle Charge Stage

Battery Model	Voltage Range: V ₅ (V per Block)	Limited Current: I ₅ (A)	Charge Time: S ₅ (h)	Temperature Compensation (V/°C)
3-EVF-180A	8.01V	1.8A	≤ 2h	-0.012
3-EVF-200A / 3-EVF-200T		2.0A		-0.012
4-EVF-150A/4-EVF-150		1.5A		-0.016
6-EVF-60		0.6A		-0.024
6-EVF-70T		0.7A		-0.024
6-EVF-80		0.8A		-0.024
6-EVF-100A / 6-EVF-100T		1.0A		-0.024
6-EVF-110T		1.1A		-0.024
6-EVF-120		1.2A		-0.024
6-EVF-150A / 6-EVF-150T		1.5A		-0.024

Table 6 - Parameters for Float Charge Stage

Battery Model	Voltage Range: V ₆ (V per Block)	Limited Current: I ₆ (A)	Charge Time: S ₆ (h)	Temperature Compensation (V/°C)
3-EVF-180A	6.9V	1.8A	≤ 4h	-0.012
3-EVF-200A / 3-EVF-200T		2.0A		-0.012
4-EVF-150A/4-EVF-150		1.5A		-0.016
6-EVF-60		0.6A		-0.024
6-EVF-70T		0.7A		-0.024
6-EVF-80		0.8A		-0.024
6-EVF-100A / 6-EVF-100T		1.0A		-0.024
6-EVF-110T		1.1A		-0.024
6-EVF-120		1.2A		-0.024
6-EVF-150A / 6-EVF-150T		1.5A		-0.024