



HOPPECKE FNC FIBER NICKEL CADMIUM batteries for stationary applications



Utilizing HOPPECKE Advanced Fiber NICKEL CADMIUM Technology for all types of standby applications

- UPS Installations
- Switchgear tripping
- Emergency lighting
- Power Generation
- Telecommunications
- Renewable Energy
- Generator Starting
- Railroad Signaling
- Off shore platforms

HOPPECKE FNC – Power from Innovation

battery technology to provide superior performance and reliability when it really counts.

Fiber NICKEL CADMIUM (FNC) technology provides the best solution for long reliable battery life in all applications. The electrochemical advantages of the FNC nickel cadmium battery insures undisturbed failsafe operation, without the risk of complete loss of power or sudden battery death. The FNC solution is the only solution for applications requiring vital or reliable system operation.

Outstanding reliability and advantages:

- Extremely long life – 25 years or more
- Wide operating temperature range of –40 to +140 deg F (-40 to +60 deg C)
- Resistance to abuse – electrical and mechanical
- Predictable aging – slow gradual decline in capacity with no sudden death near end of life
- More than 3000 deep discharge cycles (80% dod) available
- Low maintenance with HOPPECKE's Ultra Low Maintenance series

Four types of batteries are available with different performance characteristics for any application:

X-series:

This series uses ultra thin plates with very high power output for short durations. This series is typically used in engine starting applications and UPS back up systems.

H-series:

This series is designed for applications where discharges are in the range of 30 minutes or less but higher capacities are required. This range is also used in engine starting, UPS and switchgear applications.

M-series:

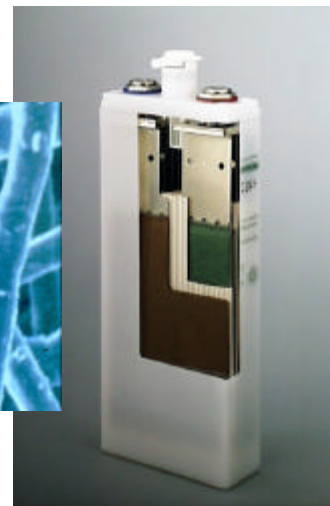
This range is typically used in applications where the discharge is between 30 minutes and 2 hours, with variable or mixed load requirements. This range is used in power back up and switchgear applications.

L-series:

The plates in this series are designed for general discharge characteristics with variable or mixed loads of high and low current discharges. Typically used in power back up, switchgear and energy storage..

SPECIFICATIONS:

- Operating temperature range:-40C to +60C (-40F to +140F)
- Float Charge: 1.42 to 1.45vpc
- Equalize Charge: 1.52 to 1.60vpc
- Recharge time to 90% available capacity: 7 – 8 hours at normal equalize voltage
- Typical recharge currents 0.1xC₅A to 0.4xC₅A (higher charge currents are possible up to 10xC₅A – consult factory for details)
- Cell jar/lid: Translucent Polypropylene
- Jar/Lid seal: welded, leak proof
- Terminals: Nickel plated steel
- Plate construction: Welded nickel plated steel and non-woven fiber plate
- Electrolyte: 20% potassium hydroxide in water (S.G. 1.19 at 20C)
- Recharge factor of 1.2 (instead of 1.4 as required for pocket plate batteries)
- Micro-porous separators
- Designed and tested in accordance with IEC 60623



Electrode Design:

The positive and negative electrodes consist of a nickel fiber matrix structure. The active materials contain no graphite or iron to increase conductivity in the electrode. These additives, not required by the unique FNC design, typically result in shortened life or performance in other nickel cadmium battery technologies.

FIBER NICKEL CADMIUM unique plate design and superior advantages:

Low Temperature Tolerance

The FNC battery electrode is highly conductive due to the active material being in direct contact with the current carrying fiber substrate, which ensures a lower internal resistance. This results in considerably less derating of the battery in cold temperatures (90 percent of rated capacity at 0F (-18C) compared to pocket plate nickel cadmium batteries (55 percent of rated capacity at 0F (-18C)).

Higher Recharge Efficiency

Because of the lower internal resistance enabling faster recharges to higher capacities. The FNC battery is 83% efficient on recharge as opposed to pocket plate batteries at 72%. The recharge factor for pocket plate is 1.4 times the capacity removed while the FNC cell is only 1.2. The reduced current on both float and high-rate charge also reduces the electrolysis of water, allowing extended watering intervals – up to 5 years on float service.

Extensive Cycle Life

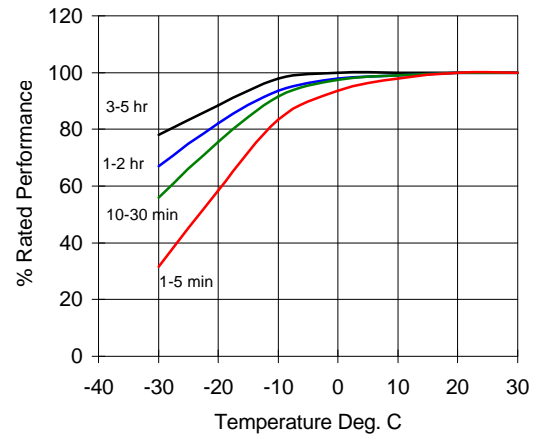
The FNC battery will produce over 3,000 deep discharge cycles with a capacity loss of 20% of its nominal capacity. Because of the unique flexible fiber design, cycle life is extended three to four times over pocket plate technology. This extended cycle life makes the FNC battery ideal for true cyclic applications.

25 Year Service Life

This can be achieved in standby operation because the electrolyte does not corrode the fiber plate as would occur in a lead acid system. Because of this, aging effects at higher temperatures are significantly less than other battery systems, resulting in a lower life cycle system cost.



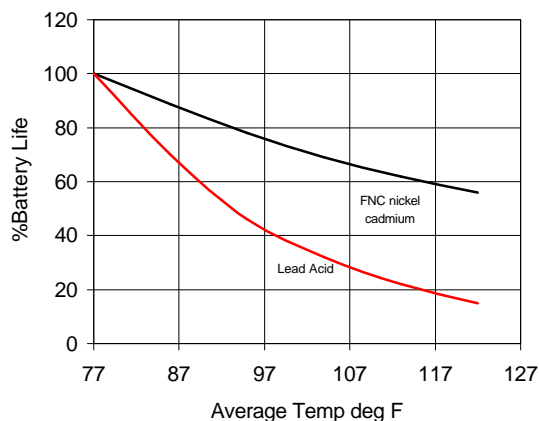
Typical Temperature Derating, FNC Nickel Cadmium Batteries



HOPPECKE FNC are ideal for all standby applications from the artic to the desert as well as offshore installations. HOPPECKE has sales offices and service support around the world.



Battery Life at Elevated Temperatures



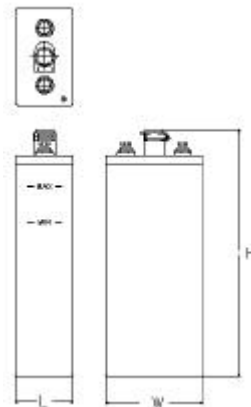


FNC Cell Types Available

Type	C5 Ah	length Inch(mm)	width Inch(mm)	height Inch(mm)	weight Max lbs(kg)
FNC103X	10	1.18(30)	4.80(122)	9.84(250)	3.1(1.38)
FNC106X	19	1.85(47)	4.80(122)	9.84(250)	5.4(2.46)
FNC110X	33	2.83(72)	4.80(122)	9.84(250)	8.3(3.74)
FNC114X	45	3.62(92)	4.80(122)	9.84(250)	11.1(5.04)
FNC118X	58	4.53(115)	4.80(122)	9.84(250)	13.7(6.24)
FNC203X	13	1.18(30)	4.80(122)	12.2(309)	3.96(1.80)
FNC206X	25	1.85(47)	4.80(122)	12.2(309)	6.95(3.16)
FNC210X	43	2.83(72)	4.80(122)	12.2(309)	10.6(4.83)
FNC214X	60	3.62(92)	4.80(122)	12.2(309)	13.9(6.31)
FNC218X	77	4.53(115)	4.80(122)	12.2(309)	17.2(7.84)
FNC201H	12	1.18(30)	4.80(122)	12.2(309)	3.3(1.52)
FNC202H	23	1.18(30)	4.80(122)	12.2(309)	3.9(1.77)
FNC203H	35	1.85(47)	4.80(122)	12.2(309)	5.9(2.68)
FNC204H	46	1.85(47)	4.80(122)	12.2(309)	6.6(3.00)
FNC205H	58	2.83(72)	4.80(122)	12.2(309)	9.2(4.17)
FNC206H	69	2.83(72)	4.80(122)	12.2(309)	9.6(4.36)
FNC207H	80	2.83(72)	4.80(122)	12.2(309)	10.1(4.58)
FNC208H	93	3.62(92)	4.80(122)	12.2(309)	10.1(5.58)
FNC209H	104	3.62(92)	4.80(122)	12.2(309)	12.7(5.78)
FNC210H	115	4.53(115)	4.80(122)	12.2(309)	15.2(6.91)
FNC211H	125	4.53(115)	4.80(122)	12.2(309)	15.9(7.21)
FNC307H	140	3.62(92)	7.64(194)	12.2(309)	18.9(8.58)
FNC308H	160	3.62(92)	7.64(194)	12.2(309)	20.2(9.16)
FNC309H	180	3.62(92)	7.64(194)	12.2(309)	20.3(9.24)
FNC310H	200	4.53(115)	7.64(194)	12.2(309)	24.4(11.1)
FNC311H	220	4.53(115)	7.64(194)	12.2(309)	25.5(11.6)
FNC201L	20	1.18(30)	4.80(122)	12.2(309)	3.5(1.60)
FNC202L	40	1.85(47)	4.80(122)	12.2(309)	5.7(2.59)
FNC203L	60	1.85(47)	4.80(122)	12.2(309)	6.1(2.76)
FNC204L	80	2.83(72)	4.80(122)	12.2(309)	8.9(4.05)
FNC205L	100	2.83(72)	4.80(122)	12.2(309)	9.4(4.28)
FNC206L	120	3.62(92)	4.80(122)	12.2(309)	11.5(5.24)
FNC207L	140	3.62(92)	4.80(122)	12.2(309)	12.3(5.61)
FNC208L	160	4.53(115)	4.80(122)	12.2(309)	15.0(6.83)
FNC209L	180	4.53(115)	4.80(122)	12.2(309)	15.2(6.92)
FNC306L	200	3.62(92)	7.64(194)	12.2(309)	18.6(8.47)
FNC307L	233	3.62(92)	7.64(194)	12.2(309)	20.2(9.17)
FNC308L	266	4.53(115)	7.64(194)	12.2(309)	23.5(10.7)
FNC309L	300	4.53(115)	7.64(194)	12.2(309)	24.0(10.9)
FNC404L	150	3.03(77)	6.18(157)	15.9(405)	16.1(7.33)
FNC405L	185	3.03(77)	6.18(157)	15.9(405)	17.1(7.79)
FNC406L	225	4.29(109)	6.18(157)	15.9(405)	22.7(10.3)
FNC407L	265	4.29(109)	6.18(157)	15.9(405)	24.0(10.9)
FNC408L	300	4.29(109)	6.18(157)	15.9(405)	26.4(12.0)
FNC409L	340	4.29(109)	6.18(157)	15.9(405)	28.8(13.1)
FNC410L	375	6.18(157)	6.18(157)	15.9(405)	33.7(15.3)
FNC411L	415	6.18(157)	6.18(157)	15.9(405)	34.8(15.8)
FNC412L	450	6.18(157)	6.18(157)	15.9(405)	36.3(16.5)
FNC413L	490	6.18(157)	6.18(157)	15.9(405)	37.6(17.1)
FNC414L	525	6.18(157)	6.18(157)	15.9(405)	38.9(17.7)
FNC512L	660	7.93(201.5)	8.2(208.5)	15.9(405)	53.5(24.3)
FNC513L	715	7.93(201.5)	8.2(208.5)	15.9(405)	54.6(24.8)
FNC514L	770	7.93(201.5)	8.2(208.5)	15.9(405)	55.7(25.3)
FNC515L	825	7.93(201.5)	8.2(208.5)	15.9(405)	56.6(25.7)
FNC516L	880	7.93(201.5)	8.2(208.5)	15.9(405)	57.6(26.2)
FNC517L	935	9.37(238)	8.2(208.5)	15.9(405)	65.6(29.8)
FNC518L	990	9.37(238)	8.2(208.5)	15.9(405)	65.1(29.6)
FNC519L	1045	9.37(238)	8.2(208.5)	15.9(405)	66.2(30.1)
FNC520L	1100	9.37(238)	8.2(208.5)	15.9(405)	67.3(30.6)

Type	C5 Ah	length Inch(mm)	width Inch(mm)	height Inch(mm)	weight Max lbs(kg)
FNC201M	20	1.18(30)	4.80(122)	12.2(309)	3.4(1.54)
FNC202M	40	1.85(47)	4.80(122)	12.2(309)	5.7(2.58)
FNC203M	60	1.85(47)	4.80(122)	12.2(309)	6.2(2.84)
FNC204M	80	2.83(72)	4.80(122)	12.2(309)	9.15(4.16)
FNC205M	100	2.83(72)	4.80(122)	12.2(309)	9.8(4.46)
FNC206M	120	3.62(92)	4.80(122)	12.2(309)	12.2(5.56)
FNC207M	140	3.62(92)	4.80(122)	12.2(309)	13.0(5.90)
FNC208M	160	4.53(115)	4.80(122)	12.2(309)	15.6(7.11)
FNC209M	180	4.53(115)	4.80(122)	12.2(309)	16.3(7.41)
FNC306M	200	3.62(92)	7.64(194)	12.2(309)	18.7(8.51)
FNC307M	233	3.62(92)	7.64(194)	12.2(309)	20.3(9.23)
FNC308M	266	4.53(115)	7.64(194)	12.2(309)	22.0(10.0)
FNC309M	300	4.53(115)	7.64(194)	12.2(309)	24.1(10.9)
FNC404M	150	3.03(77)	6.18(157)	15.9(405)	16.5(7.51)
FNC405M	185	3.03(77)	6.18(157)	15.9(405)	17.2(7.81)
FNC406M	225	4.29(109)	6.18(157)	15.9(405)	23.1(10.5)
FNC407M	265	4.29(109)	6.18(157)	15.9(405)	23.1(10.5)
FNC408M	300	4.29(109)	6.18(157)	15.9(405)	26.4(12.0)
FNC409M	340	4.29(109)	6.18(157)	15.9(405)	34.1(15.5)
FNC410M	375	6.18(157)	6.18(157)	15.9(405)	35.2(16.0)
FNC411M	415	6.18(157)	6.18(157)	15.9(405)	35.7(16.2)
FNC412M	450	6.18(157)	6.18(157)	15.9(405)	37.0(16.8)

CELL DIMENSIONS



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