

**FIRST
NATIONAL** **Battery**™
WORLD CLASS BATTERY MANUFACTURER

**STANDBY
BATTERIES**

**Flat Plate Cells
ZCF and ZHF**



PRODUCT AND SERVICE BENEFITS

- **Premier Quality**

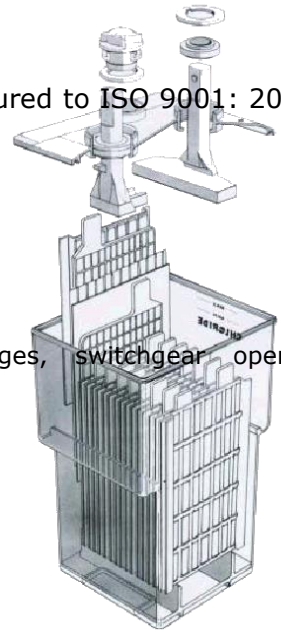
Conforms to BS 6290 2000 and IEC 60896-11;2002 standards and manufactured to ISO 9001: 2008 quality standards

- **Proven Reliability**

Used successfully, achieving claimed life, in numerous applications.

- **Customer Care**

Every standby cell carries a comprehensive product warranty.



DESIGN FEATURES

Designed for all standby duties including power stations, telephone exchanges, switchgear operation, telecommunications, emergency lighting and diesel starting.

Noteworthy advantages of these cells are:

- Ease of inspection, test and maintenance.
- Float charge operation, always ready for use.
- Life expectancy of 15 years
- Increased capacity, combined with decreased volume and weight.

POSITIVE PLATE

Constructed of 5mm industrial grids pasted with a long-life paste formulation, suitable for float charge and cycling applications.

NEGATIVE PLATE

Industrial pasted grid construction, for balanced performance and life.

SEPARATORS

Made of microporous rubber, for exceptionally long life and have high degree of porosity, ensuring minimum internal resistance

CELL PILLARS AND CONNECTORS

Specially designed to give minimum resistance – maximum current flow.

TECHNICAL DETAILS

FLOAT CHARGING

As these cells are designed for standby applications they should be float charged to ensure that they remain fully charged, ready for instant use, at all times. Correct float voltage settings may vary depending upon operational differences but as a guideline 2.25 volts per cell at 25°C may be used as a level of charge which will minimise the need for equalising charges whilst providing acceptable life. The installation and maintenance manual should be read for further information.

SPECIFIC GRAVITY

A simple hydrometer reading indicates the state of charge. A fully charged cell will have a specific gravity of 1.250.

VOLTAGE

The nominal voltage is 2 volts per cell, i.e. a nominal 110V battery will have 55 cells. On discharge, the recommended final voltage at which the discharge should be terminated depends on the discharge rate. It is not recommended to continue discharging the cells once the final voltage has been reached as the voltage will fall away at an increasing rate with minimal gain of discharge duration and the risk of over-discharge.

CAPACITY

The capacity of these cells is normally rated at the 10hour rate of discharge although the capacity which can be taken from a cell will vary depending on the discharge rate, as indicated in the capacity table. Capacity is also affected by the cell temperature.

INSTALLATION

These cells can be connected either edge to edge or face to face. The standard method of connection is to follow the shortest distance between the negative post on one cell and the positive post on the next cell.

RECHARGING

The cell's ampere hour efficiency is 90%. To fully recharge the cells the amount of charge required is equal to the amount of discharge in ampere hours plus 11%.

TRANSPARENT CONTAINERS

Moulded from transparent styrene acrylonitrile (SAN) to provide optimum transparency and very high insulating qualities.

CELL LIDS

Moulded from opaque SAN. Are permanently sealed to the container.

VENT PLUGS

Are of a special design which effectively returns all acid spray to the cell, but allows free exit of oxygen and hydrogen gasses.

Flat Plate: Capacities, Weights and Dimensions

Type	Capacity in amphotours at 25°C when discharged in			Initial Charge Current	Weight		84.9 Approx Quality of acid 1.210sg	External dimensions of cell container			Overall height of cells	Centres of cells	Width of single row stilage or stand	Width of double row stilage or stand
	10 Hours	3 Hours	1 Hour		Cell compl. filled	Acid only 1.210sg		Length	Width	Height				
Final Voltage	1.80	1.80	1.75	Amps	Kg	Kg	Litres	mm	mm	mm	mm	mm	mm	mm
ZCF 5	64	46	32	5	11.5	6.7	5.4	134	203	349	423	140	400	710
ZCF 7	96	69	48	7	12.9	6.4	5.2	134	203	349	423	140	400	710
ZCF 9	128	92	64	9	14.2	6.1	5.0	134	203	349	423	140	400	710
ZCF 11	160	115	80	11	15.6	5.9	4.8	134	203	349	423	140	400	710
ZCF 13	192	138	96	13	17.0	5.6	4.6	134	203	349	423	140	400	710
ZCF 15	224	161	112	16	20.8	7.7	6.3	172	203	349	423	178	400	710
ZCF 17	256	184	126	18	22.2	7.5	6.1	172	203	349	423	178	400	710
ZCF 19	288	207	144	20	23.5	7.3	5.9	172	203	349	423	178	400	710
ZCF 21	320	230	160	22	27.4	9.4	7.6	210	203	349	423	209	406	662
ZCF 23	352	253	176	25	28.7	9.1	7.4	210	203	349	423	209	406	662
ZCF 25	384	276	192	27	33.0	11.3	9.1	248	203	349	423	209	426	742
ZCF 27	416	299	208	29	34.3	11.0	8.9	248	203	349	423	209	426	742
ZCF 29	448	322	224	31	35.7	10.8	8.8	248	203	349	423	209	426	742
ZCF 31	480	345	240	34	39.7	12.9	10.5	286	203	349	423	209	464	818
ZCF 33	512	368	256	36	41.0	12.7	10.3	286	203	349	423	209	464	818
ZCF 35	544	391	272	38	45.6	14.9	12.1	362	203	349	423	209	542	974
ZCF 37	576	414	288	40	47.0	14.7	11.9	362	203	349	423	209	542	974
ZCF 39	608	437	304	42	48.3	14.4	11.7	362	203	349	423	209	542	974
ZCF 41	640	460	320	44	49.7	14.2	11.5	362	203	349	423	209	542	974
ZCF 43	672	483	336	47	51.1	14.0	11.3	362	203	349	423	209	542	974
ZHF 13	786	556	353	55	75.8	35.7	28.9	230	368	592	682	240	370	969
ZHF 15	920	648	412	64	80.0	34.8	28.2	230	368	592	682	240	370	969
ZHF 17	1050	741	470	73	84.2	33.9	27.2	230	368	592	682	240	370	969
ZHF 19	1180	834	529	82	88.4	33.0	26.8	230	368	592	682	240	370	969
ZHF 21	1310	927	588	91	92.6	32.1	26.0	230	368	592	682	240	370	969
ZHF 23	1440	1020	647	100	113.6	47.1	38.2	306	368	592	682	315	370	969
ZHF 25	1570	1113	706	109	118.0	46.2	37.4	306	368	592	682	315	370	969
ZHF 27	1700	1206	764	119	122.2	45.3	36.7	306	368	592	682	315	370	969
ZHF 29	1830	1299	823	128	126.4	44.4	36.0	306	368	592	682	315	370	969
ZHF 31	1970	1392	882	137	130.6	43.5	35.2	306	368	592	682	315	370	969
ZHF 33	2100	1482	941	147	146.3	53.3	43.1	357	368	592	682	366	360	969
ZHF 35	2230	1575	1000	156	150.4	52.4	42.4	357	368	592	682	366	360	969
ZHF 37	2360	1668	1058	165	154.7	51.5	41.7	357	368	592	682	366	360	969
ZHF 39	2490	1761	1117	174	158.9	50.6	40.9	357	368	592	682	366	360	969
ZHF 41	2620	1854	1176	183	163.1	49.7	40.2	357	368	592	682	366	360	969
ZHF 43	2750	1947	1235	192	183.5	64.7	42.4	433	368	592	682	379	435	1099
ZHF 45	2880	2040	1294	201	187.7	63.8	51.6	433	368	592	682	379	435	1099
ZHF 47	3010	2133	1352	210	191.9	62.9	50.9	433	368	592	682	379	435	1099
ZHF 49	3140	2226	1411	220	196.1	62.0	50.2	433	368	592	682	379	435	1099
ZHF 51	3280	2319	1470	229	200.3	61.1	49.4	433	368	592	682	379	435	1099
ZHF 53	3410	2409	1529	238	221.5	76.0	61.6	509	368	592	682	379	510	1249
ZHF 55	3540	2502	1588	247	225.7	75.1	60.8	509	368	592	682	379	510	1249
ZHF 57	3670	2595	1646	257	229.9	74.2	60.1	509	368	592	682	379	510	1249
ZHF 59	3800	2688	1705	266	234.1	73.3	59.4	509	368	592	682	379	510	1249
ZHF 61	3930	2781	1764	275	238.3	72.4	58.7	509	368	592	682	379	510	1249
ZHF 63	4060	2874	1823	284	261.2	87.6	71.0	585	368	592	682	379	586	1401
ZHF 65	4190	2967	1882	293	265.4	86.7	70.2	585	368	592	682	379	586	1401
ZHF 67	4320	3060	1940	302	269.6	85.8	69.5	585	368	592	682	379	586	1401
ZHF 69	4450	3153	1999	311	273.8	84.9	68.8	585	368	592	682	379	586	1401

The length of a stand is n x cell centre where n is the number of cells in a row.

**Corner Liverpool & Bristol Roads,
Benoni South, 1502
P.O. Box 5015 Benoni South, 1502
South Africa
Telephone: +27 11 741 3600
Fax: +27 11 421 2642**



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SANS IEC 60896-11: 2003

**For More Information Contact:
FIRST NATIONAL BATTERY
TOLL FREE: 0800 112600
www.battery.co.za**

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