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SPECIFICATION

Type:	Ni-Cd Cylindrical Cell
Model No.:	IPX-2000Cs
Prepared:	CYL
Approved:	LFX
Date:	11 Oct, 2011



1. PREFACE

This specification applies to the Intec Nickel-Cadmium Cylindrical batteries or battery packs. Intec reserves the right to alter the product design or amend this specification without prior notice.

2. TYPE

The specification applies to the following sealed Nickel-Cadmium battery.

Type: IPX-2000Cs

Size: Cs

3. CHARACTERISTICS

- ★ Nominal voltage: 1.2 V
- ★ Nominal capacity: 2000 mAh (0.2C)
- ★ Standard charge: 200 mA × 16h
- ★ Fast charge: 2000 mA × 1.2h, (- Δ V = 5 mV)
- ★ Trickle charge: 67~100 mA
- ★ Discharge cut-off voltage: 1.0 V/unit (20°C)
- ★ Max current of constant discharge: 20 A (20°C, unit cell)
- ★ Max current of momentary discharge: 30 A (20°C, unit cell)
- ★ Operating temperature range: (Max relative humidity: 85%)
 - Standard charge 0 ~ +40°C
 - Trickle charge 10 ~ +45°C
 - Fast charge 10 ~ +40°C
 - Discharge -20 ~ +60°C
- ★ Storage temperature range: (Max relative humidity: 85%)
 - Within two years -20 ~ +30°C
 - Within two months -20 ~ +40°C
 - Within one month -20 ~ +50°C
 - Within one week -20 ~ +60°C

4. EXTERNAL DIMENSION/WEIGHT

4.1 Dimensions: φ 22.5±0.5 × 42.5±0.5 (mm)

4.2 Gross weight: 50 (g)

5. CELL PERFORMANCE

5.1 TEST REQUIREMENTS

The following conditions are for new batteries (within one month after delivery under the test method of 5.2).

Environmental temperature: +15 ~ +25°C; Relative humidity: 45% ~ 85%.



5.2 TEST METHOD AND EXTERNAL PERFORMANCES

5.2.1 APPEARANCE

The cell should be free from stretches, dents, dirt and rusts.

5.2.2 CAPACITY

Charge with 0.1C for 16 hours then discharge with 0.2C to the end-voltage 1.0 V/unit, the capacity shall be more than 2000 mAh.

5.2.3 OPEN-CIRCUIT VOLTAGE

The open-circuit voltage within one hour after full charge shall be more than 1.25V/unit.

5.2.4 INTERNAL IMPEDANCE

Within one hour after full charge, the internal impedance shall be less than 11 mΩ / cell.

5.2.5 HIGH RATE DISCHARGE

The capacity shall be more than 1800 mAh with the constant discharge current of 2000mA to the end voltage of 1.0V after the battery is fully charged.

The capacity shall be more than 1500 mAh with the constant discharge current of 10000mA to the end voltage of 0.8V after the battery is fully charged.

5.2.6 SELF-DISCHARGE

The capacity shall be more than 1400 mAh after the storage of 28 days for the fully charged battery.

5.2.7 OVER-CHARGE I

The battery shall not cause salting, leakage or deformation when charged at 200 mA for 48 hours and the capacity shall be more than 2000 mAh.

5.2.8 OVER DISCHARGE

The battery shall not cause deformation when it is discharged for 24 hours with the external resistance at 0.5 Ω.

5.2.9 LIFE-SPAN (CUSTOM)

The capacity shall be more than 1400 mAh after 500 cycles with the test conditions as follow:

TEST CONDITION

Cycle	Charge	Rest	Discharge
1 st	Charge at 0.15C for 12 hrs	None	Discharge at 0.25C for 2.33 hrs
2 nd – 48 th	Charge at 0.25C for 3.17 hrs	None	Discharge at 0.25C for 2.33 hrs
49 th	Charge at 0.25C for 3.17 hrs	None	Discharge to 1.0V/unit
50 th	Charge at 0.15C for 12 hrs	1 ~4 hrs	Discharge at 0.2C to 1.0V/unit



5.2.10 LIFE-SPAN (EXPRESS)

The battery shall supply 1400 mAh at the 400th cycle under the conditions as follows.

Charge	1C for 72 minutes (- Δ V= 5 mV)
Discharge	1C to 1.0V/unit

5.2.11 STORAGE

Within 14 days, the battery shall not cause leakage at 30-60°C with the relative humidity at 75%-85%.

5.2.12 VIBRATION

The battery shall not cause damage to its performances when tested with the amplitude at 4 mm (0.158 inch) and the frequency at 1000Hz.

5.2.13 DROP TEST

The battery shall keep normal when dropped from a height of 450 mm (17.716 inch) to the wooden board.

5.2.14 SHORT CIRCUIT

The fully charged battery shall not explode when shorted directly by wires.

5.2.15 INCORRECT POLARITY CHARGE

The battery shall not explode when charged for 5 hours with the polarity being reverse.

5.2.16 OVER CHARGE II

The battery shall not explode when charged at 1C for 5 hours.

6. SUGGESTION & ADVICE

- A. The end-voltage is recommended at $1.0 \pm 0.1V/cell$.
- B. The battery may go fail when shorted, over-charged or charged with incorrect polarity.
- C. Avoiding soldering directly to the battery.
- D. Do not dispose of in fire and keep away from damage.

7. REFERENCE

Please refer to Intec’s Customer Service if there is any question on using batteries.



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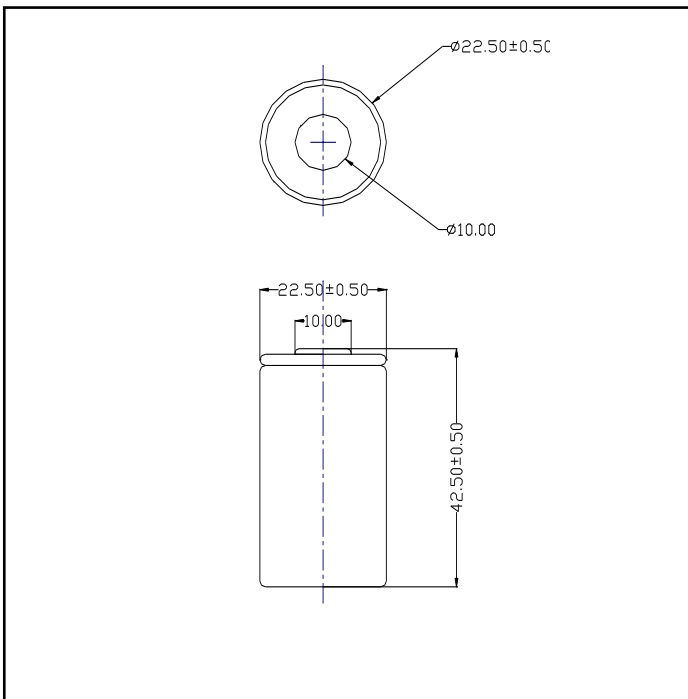
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SPECIFICATIONS

Nominal voltage		1.2V		
Capacity (mAh)		C/5	C	
	Nominal	2000	1800	
	Typical	2060	1850	
Diameter		0.89 ± 0.02 in 22.5 ± 0.5 mm		
Height		1.67 ± 0.02 in 42.5 ± 0.5 mm		
Weight		50g		
Internal impedance at 1000Hz.		11mΩ (After charge)		
Charge	Standard	200mA × 16hrs		
	Fast	2000mA × 1.2hrs		
	Trickle	Max.	100mA	
		Min.	67mA	
Ambient temperature	Charge	Standard	0°C ~ 40°C	
		Fast	10°C ~ 40°C	
	Discharge	-20°C ~ 60°C		
	Storage	-20°C ~ 30°C		

Note:

1. Nominal capacity, rated at C/5, 20°C.
2. Other capacities are for reference.
3. Weight and internal impedance are for reference.



TYPICAL CHARACTERISTICS

