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SPECIFICATION

Type:	Ni-Cd Cylindrical Cell
Model No.:	IF-1000AA
Prepared:	FHY
Approved:	LFX
Date:	Feb 22, 2010



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: IF-1000AA

3. CHARACTERISTICS

- ★ Nominal voltage: 1.2 V.
- ★ Nominal capacity: 1000 mAh(0.2C₅).
- ★ Standard charge: 100 mA × 15h.
- ★ Fast charge: 1000 mA × (~1.2)h, (-ΔV = 10 mV).
- ★ Trickle charge: 33~50 mA.
- ★ Discharge cut-off voltage: 1.0 V/cell(20°C).
- ★ Max current of constant discharge: 2 A(20°C, unit cell).
- ★ Operating temperature range. (Max relative humidity: 85%)

Standard charge	0 ~ +45°C
Trickle charge	10 ~ +45°C
Fast charge	10 ~ +45°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 14.5 × 49.0 (mm);
- 4.2 Gross weight: 25 (g);

5. APPEARANCE PERFORMANCE

5.1 TEST REQUIREMENTS

The following conditions are for new batteries (within one month after delivery under the test method of 5.2.2).

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



5.2 TEST METHOD AND 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 15 hours then discharge with 0.2C to the end-voltage 1.0 V/unit, the capacity shall be more than 1000 mAh.

5.2.3 OPEN-CIRCUIT VOLTAGE

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

5.2.4 INTERNAL IMPEDENCE

Within one hour after full charge, the internal impedance shall be less than 35 mΩ /cell.

5.2.5 HIGH RATE DISCHARGE

The capacity shall be more than 850 mAh with the constant discharge current of 1000mA to the end voltage of 1.0V/unit after the battery is fully charged.

5.2.6 SELF-DISCHARGE

The capacity shall be more than 700 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 reformation when charged at 100 mA for 48 hours and the capacity shall be more than 1000 mAh.

5.2.8 OVER DISCHARGE

The battery shall not cause reformation when it is discharged for 24 hours with the external resistance at 1.5 Ω .

5.2.9 LIFE-SPAN (CUSTOM)

The capacity shall be more than 600 mAh after 500 cycles with the test conditions as follow:

TEST CONDITION

Cycle-th	Charge	Rest	Discharge
1	Charge at 0.1C ₅ for 16 hours	None	Discharge at 0.25C ₅ for 2.33 h
2 ~ 48	Charge at 0.25C ₅ for 3.17 hours	None	Discharge at 0.25C ₅ for 2.33 h
49	Charge at 0.25C ₅ for 3.17 hours	None	Discharge to 1.0V/unit
50	Charge at 0.1C ₅ for 16 hours	1 ~ 4 hours	Discharge at 0.2C ₅ to 1.0V/unit



5.2.10 LIFE-SPAN (EXPRESS)

The battery shall supply 600 mAh at the 400th cycle under the conditions as follows.

Charge	0.5C₅ for 144 minutes (- Δ V= 10 mV)
Discharge	1C₅ 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 3 hours.

6. CAUTION

- A. The end-voltage is recommended at $1.0 \pm 0.1V/cell$ so as not to cause memory effect.
- 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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Specification

Nominal voltage		1.2V	
Capacity (mAh)		C/5	C
	Nominal	1000	850
	Typical	1030	880
Diameter		14.0 ± 0.5 mm	
Height		48.0 ± 1.0 mm	
Weight		25 g	
Internal impedance at 1000Hz.		35 mΩ (After charge)	
Charge	Standard	100mA × 15hrs.	
	Fast	1000mA × 1.2hrs.	
	Trickle	Max.	50mA
		Min.	33mA
Ambient temperature	Charge	Standard	0°C ~ 45°C
		Fast	10°C ~ 45°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

