



**Intec Industries Co., Ltd.**  
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# SPECIFICATION

|                   |                        |
|-------------------|------------------------|
| <b>Type:</b>      | Ni-CD Cylindrical Cell |
| <b>Model No.:</b> | IC-3000C               |
| <b>Prepared:</b>  | HML                    |
| <b>Approved:</b>  | LFX                    |
| <b>Date:</b>      | Nov 10, 2006           |



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**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. SCOPE**

This specification applies to a Nickel Cadmium cylindrical rechargeable single cell with INTEC designation IC-3000C

**3. REFERENCE DOCUMENT**

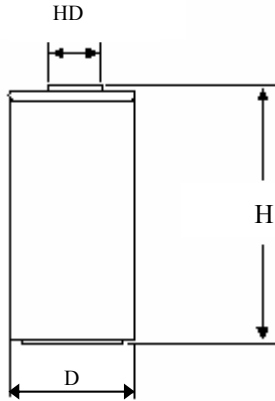
IEC60285 Edition 3.2 1999-06: Sealed Ni-Cd cylindrical rechargeable single cells.

**4. GENERAL ELECTRICAL SPECIFICATION**

| ITEM                          | SPECIFICATION | UNITS        | NOTES                               |
|-------------------------------|---------------|--------------|-------------------------------------|
| INTEC cell designation        | IC-3000C      |              |                                     |
| Nominal voltage               | 1.2           | Volt         |                                     |
| IEC Rated Capacity            | 3000          | mAh          | at C/5                              |
| Typical Capacity              | 3150          | mAh          | at C/5                              |
| Typical Capacity              | 2850          | mAh          | at C                                |
| Typical impedance             | 14            | m $\Omega$   | at 1000 Hz                          |
| <b>CHARGE CURRENT</b>         |               |              |                                     |
| Standard (16 hours)           | 300           | mA           | C/10                                |
| Fast (3 – 4 hours)            | 900           | mA           | 0.3C with proper charge termination |
| Trickle (after fast charge)   | 100 - 150     | mA           |                                     |
| <b>PEAK VOLTAGE IN CHARGE</b> |               |              |                                     |
| Standard                      | 1.50 to 1.55  | Volts        |                                     |
| Fast                          | 1.55 to 1.65  | Volts        |                                     |
| <b>MAX.DISCHARGE CURRENT</b>  |               |              |                                     |
| Continuous                    | 6             | A            |                                     |
| Pulse (1 second)              | 30            | A            |                                     |
| <b>TEMPERATURE RANGE</b>      |               |              |                                     |
| In Standard Charge            | +10 to +45    | $^{\circ}$ C |                                     |
| In Fast Charge                | +10 to +40    | $^{\circ}$ C |                                     |
| In Discharge                  | -20 to +60    | $^{\circ}$ C |                                     |
| In recommended Storage        | +5 to +25     | $^{\circ}$ C |                                     |
| In Extended Storage           | -20 to +40    | $^{\circ}$ C |                                     |



**5. GENERAL MECHANICAL SPECIFICATION**



CELL DIMENSIONS (with white PVC Sleeve)

High hat diameter (HD):  $8.0 \pm 0.5$  mm

Height (H):  $49.5 \pm 0.5$  mm

Diameter (D):  $25.5 \pm 0.5$  mm

Typical weight: 78 g

**6. CAPACITY**

**6.1 IEC capacity**

IEC Capacity is defined as follows:

- Temperature:  $+20 \pm 5^\circ\text{C}$
- Charge current:  $C/10=300\text{mA}$  constant current
- Charge duration: 16 hours
- Period of rest: 1 to 4 hours
- Discharge current:  $C/5=600$  mA constant current

The operating time until the voltage drops to 1.0 volt/cell must not be less than 300 minutes-3 cycles are permitted. Therefore, the IEC Capacity is minimum 3000 mAh.

**6.2 AVAILABLE CAPACITY**

The following table gives the available capacity of a IC-3000C battery under various charge and discharge conditions. The temperature is  $+20 \pm 5^\circ\text{C}$ . Deviation depending on test conditions may be observed.

| CHARGE              |              |                 |                          |
|---------------------|--------------|-----------------|--------------------------|
| Rate                | Current (mA) | Duration (hour) | Rest after charge (hour) |
| 0.05C               | 150          | >32             | No rest                  |
| 0.1C                | 300          | 16              | 1                        |
| 0.3C (with control) | 900          | 4               | 1                        |

| DISCHARGE |              |                |
|-----------|--------------|----------------|
| Rate      | Current (mA) | Capacity (mAh) |
| 0.2C      | 600          | 3150           |
| 1.0C      | 3000         | 2850           |
| 2.0C      | 6000         | 2550           |

\*Cutoff voltage 0.8 Volts per cell



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**7. CHARGE RETENTION**

After a 28 day storage at  $20 \pm 5^{\circ}\text{C}$ , a IC-3000C battery shall retain typically 70% of its initial capacity for a fully charged battery.

**8. STORAGE**

Intec recommends to store the battery in a  $65\% \pm 5\%$  relative humidity room with the temperature range of  $+5$  to  $25^{\circ}\text{C}$ .

**9. OVERCHARGE**

After a 28 days continuous charge at  $0.05\text{C}$  (150mAh) at  $0^{\circ}\text{C} \pm 2^{\circ}\text{C}$ , the capacity at  $0.2\text{C}$  discharge rate of a IC-3000C battery at 1.0Volts/cell is typically 2.7Ah.

**10. CYCLE-LIFE**

The cycle-life of a rechargeable battery depends on various parameters such as charge rate, discharge rate, depth of discharge, overcharge temperature, period of rest between charge and discharge.

The rechargeable battery reaches its end of life when its capacity is 60% of the initial capacity. Typical life of a IC-3000C battery is 4 years with the average operating conditions defined as follows:

Working battery temperature:  $+25^{\circ}\text{C}$ .

Permanent charge current:  $0.05\text{C}$ .

Discharge / month at  $0.5\text{C}$  discharge rate.

**11. PRECAUTIONS**

- A. Do not short-circuit, over-charge or reverse-charge the cell.
- B. Do not solder directly to the batteries.
- C. Do not dispose of in fire and keep away from damage.
- D. Perform standard cell charging and discharging procedure after long term storage.
- E. Keep away from reach of children.

**12. REFERENCE**

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