

# **Lithium Reserve Batteries**

HBL is the largest manufacturer of specialized batteries in India, for Industrial, Telecom, Railways and Defence applications. Established in 1977, HBL offers its customers the most appropriate technology based on the requirement, from the wide range of batteries – Lead acid & Nickel cadmium, Silver zinc, Lead acid and Lithium thermal batteries. The company has sales of about US \$ 200 million and a very substantial design and development capabilities, in-house.

Lithium and Lead Reserve Batteries are used in Fuzes of various Military and Naval weapon systems, Projectiles, Bombs and Missiles. These Batteries are unique. They can be stored for more than 20 years prior to activation. A substantial amount of electro-chemical energy can be stored in a small volume in the Reserve Battery without any energy loss.

HBL Reserve Battery unit has been working comprehensively in the field of Lithium and Lead Reserve Batteries, Turbo-Alternators and Safety & Arming Devices since 1988. Our Reserve Batteries are designed, developed and manufactured using In-house patented technology-to meet customized requirements.

HBL Reserve Batteries are hermetically sealed and designed to withstand high setback shock (up-to 50000 'g's) and spin (up-to 30000 rpm) to which the munitions are subjected during combat, and still supply power with utmost reliability to the electronic circuitry in the munitions. Our Reserve Batteries are designed to function consistently over a temperature range of  $-45^{\circ}$ C to  $+71^{\circ}$ C.

HBL has the Capabilities to Design, Develop, Manufacture and Supply Lithium and Lead Reserve Batteries for use on

۲	Missiles	۲	Guided bombs
۲	Mortars	۲	Fuses – safety and arming circuits
۲	Rockets	۲	Mines – underwater and land
۲	Guided artillery and equipment	۲	Emergency power kits
۲	Counter-measure devices	$\odot$	Telemetry and range safety

HBL has developed many types of Batteries and is already supplying them for various applications to customers in India and Abroad

- A very high Reliability (> 99.95 %) has been achieved in our Design and Manufacturing Process.
- All these Batteries meet the most stringent of requirements as per MIL 331C and MIL 810C (Environmental specifications) unless otherwise specified differently by the Customer.

### PD FUZE RESERVE BATTERY



CHEMISTRY: LISOCI<sub>2</sub> APPLICATION:PD FUZE

Diameter -1(mm)	34.5(max)
Diameter -2 (mm)	22.0 (max)
Height (mm)	33( max)
Weight (gm)	70 (max)
Open circuit voltage (V)	18 to20
Operating voltage(V)	12 to16
end voltage (V)	12
Activation spin (RPM)	3000
Survival spin (RPM)	25000
Activation set back force (g)	2000
Survival set back force (g)	30000
Discharge current (mA)	30
Discharge duration (sec)	≥ 200
Activation time	6V in
	150ms

Diameter (mm)	17.8 max
Height (mm)	44.0 max
Weight (gm)	75 (max)
Open circuit voltage (V)	3.6
Operating voltage (V)	3.2
end voltage (V)	2.5
Discharge current (mA)	12 & 4
Discharge duration (sec)	10 min & 40 hrs
Voltage raise time	2.5v in 2.5sec
Operation temp	(o C)- 40 - + 71
Storage temp (0C)	- 30 - + 71

### BTYTYPE: MF-260



CHEMISTRY: LISOCI2 APPLICATION: MF-260 MINE FUZE

### BTYTYPE: MF-265



CHEMISTRY: LISOCI<sub>2</sub> APPLICATION: MF-265MINE FUZE

Diameter ( mm)	16.0 max
Height( mm)	44.0 max
Weight (gm)	75 (max)
Open circuit voltage (V)	3.6
Operating voltage	3.2
End voltage (V)	2.5
Discharge current (mA)	30
Discharge duration( min)	30
Voltage raise time	2.5v in 2.5sec
Operation temp( 0C)	- 40 - + 71
Storage temp( 0C)	- 30 - + 71

## E. FUZE BATTERY



CHEMISTRY: LISOCI2 APPLICATION: E.FUZE

Diameter -1 (mm)	37.0 ± 0.5	
Diameter -2 (mm)	$25.0 \pm 0.5$	
Height (mm)	500 ± 0.5	
Weight (gm)	75 (max)	
Open circuit voltage (V)	26	
Operating voltage (V)	14	
End voltage (V)	9	
Activation set back force (g)	>6000	
Survival set back force (g)	25000	
Disch.current (mA)	200	
Disch. duration (sec)	200	
Activation time	9V in 200ms	

Diameter-1(mm)	32
Diameter-2 (mm)	Not Applicable
Height (mm)	36
Weight(gm)	75(max)
Open circuit voltage (V)	40V (max)
Operating voltage/end voltage,(V)	24 to 34
Activation spin ( Rpm )	2000
Survival spin ( Rpm)	25000
Activation set back force (g)	2000
Survival set back force (g)	30000
Discharge current (mA)	a) 10 mA for 195 sec
	b) 70mA pulse from 195th to 200 sec.
Discharge duration	≥ 200sec
Voltage Raise time/	
Activation time (m.sec)	Not Applicable
Operation temp (°C)	- 40 - +55
Storage temp (°C)	- 40 - +70

### **PROX. FUZE BATTERY**



CHEMISTRY: LISOCL2 APPLICATION : PROX. FUZE(CW- RADAR)

#### BTY.TYPE: PROXIMITY-FMCW



CHEMISTRY: LISOCL2 APPLICATION : PROXIMITY.FUZE(FMCW)

Diameter-1(mm)	32
Diameter-2 (mm)	Not Applicable
Height (mm)	36
Weight(gm)	75
Open circuit voltage (V)	20
Operating voltage / end voltage,(V)	12
Activation spin rpm (min)	2000
Survival spin g (min)	25000
Activation set back force (g)	2000
Survival set back force (g)	30000
Discharge current (mA)	a)10 mA for 195 sec
	b) 300mA pulse from 195th to 200 sec.
Discharge duration	≥ 200sec
Voltage raise time/ Activation time	Not Applicable
Operation temp (°C)	- 40 - +55
Storage temp (°C)	- 40 - +70

