

PRIMARY LITHIUM BATTERY SELECTOR GUIDE



S A F T

THE BATTERY COMPANY

March 2003

SAFT LITHIUM BATTERIES: MEETING YOUR NEEDS

For more than 31 years, Saft has pioneered the development and production of primary lithium cells and battery packs in Europe, North America and Asia/Pacific.

Autonomy, power, voltage, shape, weight, service life, price... Saft knows how to tailor battery solutions you can count on.

With more than 4,000 employees, 2 R&D centers, 9 manufacturing facilities and 26 local sales organizations, a product range offer covering the 3 main primary lithium chemistries of today, Saft is a truly international player in the field of batteries and power supply systems for professional, industrial, space and military uses.

Among recognized characteristics of the Saft spirit worldwide are quality, performance, reliability, openness and an ability to meet the most demanding challenges. Take advantage of them for your applications!

Lithium power at your service

Lithium is a light metal which exhibits an exceptional specific capacity (3.86 Ah/gram) and unique electrochemical characteristics.

Combining lithium with manganese dioxide (MnO_2) powder or low-freezing point liquid cathode materials such as thionyl chloride ($SOCl_2$) or sulfur dioxide (SO_2), results in batteries with high energy, low weight, reduced self-discharge rate, and ability to operate under extreme conditions.

Saft's lithium products

3 lithium chemistries are currently available:

- Lithium-thionyl chloride ($Li-SOCl_2$)
in LS/LST/LSH 3.6 V cells,
- Lithium-sulfur dioxide ($Li-SO_2$)
in G/LO 3.0 V cells,
- Lithium-manganese dioxide ($Li-MnO_2$)
in LM 3.0 V cells.



SAFT LITHIUM BATTERIES: EXCEEDING YOUR EXPECTATIONS

The LS and LST cells are *cylindrical* and based on the high-energy concentric "bobbin" electrode configuration. They are available in *standard* and *high capacity "C"* versions, both adapted to low current applications.

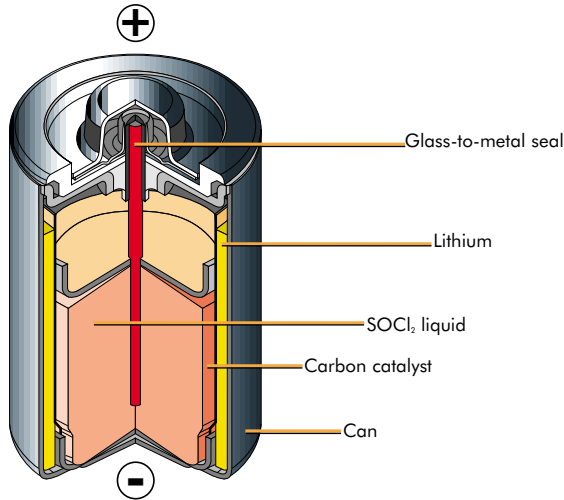
The LSH, G, LO and LM cells are also *cylindrical* but use the power-optimized "spiral" electrode construction. The cells are available in "SX" and "G" *standard versions* and in *high pulse capability "SHX"* versions.

The spiral LM cell series is completed with 3 button cells aimed at memory back-up.

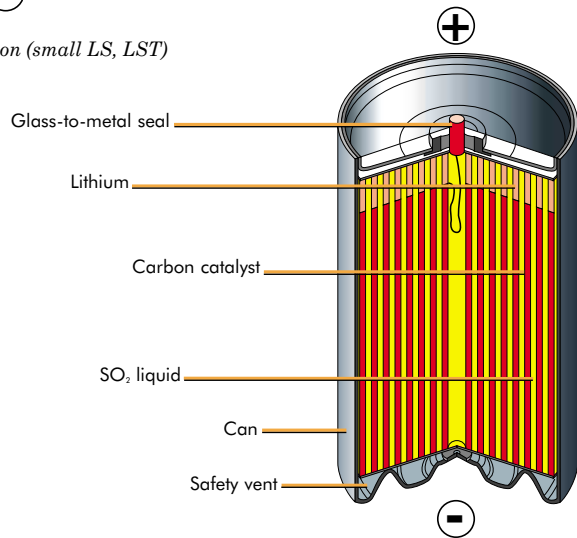
Corrosion-proof containers, hermetic sealing based on rugged glass-to-metal seals and TIG or laser welds, built-in safety vents and individual protection fuses are design features common to most of Saft's lithium cells.

The LS/LST/LSH/G/LO/LM cells are available as single units (with different optional finishes) or assembled within battery packs.

Whatever your application, you will probably find a Saft lithium battery able to meet your particular requirements. If not, custom-made solutions can be developed within your time-to-market constraints.



Bobbin construction (small LS, LST)



Spiral construction (LO, G)

SAFT PRIMARY LITHIUM BATTERIES: APPLICATIONS

	Memory back-up	Real time clocks	Utility metering AMR	Security Alarms	Electronic toll collection	Automotive electronics	Radio communication	Emergency location Buoys	Lighting Night vision	Medical defibrillators	Downhole logging	Meteorology Space	Professional electronics
LM buttons	▼	▼		▽									▼
LS, LST small bobbins (½ AA, AA, ¾A, A)	▼	▼	▼	▼	▼	▼		▼	▼		▼		▼
LS large bobbins (C, D)	▼		▼	▼		▽		▼	▼		▽	▼	▼
LSH spirals			▽	▼		▽	▼	▼	▼		▼	▼	▼
G/LO spirals			▽	▼		▽	▼	▼	▼	▼		▼	▼
LM spirals			▽	▼		▼	▼	▼	▼	▼		▼	▼

▼ recommended

▽ possible

SAFT PRIMARY* LITHIUM CELLS: KEY FEATURES

* Primary batteries are not rechargeable.

- **High and stable operating voltage**
 - Above 3.0 V for LS/LST/LSH cells.
 - Above 2.5 V for LO/G/LM cells.
- **Wide current capability range**

From a few microamperes base current for the LM buttons and small LS/LST cells to more than 10 A pulses for some LO, G, and LM cells.
- **Wide operating temperature range**

From -60°C up to 85°C depending on cell type, current drain and environment conditions.
- **Long shelf life**

Capacity loss in storage at +20°C below 1% (LS, LST, LM) and 3% (LSH, G, LO) per year.
- **Extended operating life**

Typically above 5 years, and up to 12 years for some applications.
- **High energy densities**

3-10 times greater than the other non-lithium systems.
- **Easy disposal**

According to local regulations.
- **Adequate safety**

Most of Saft's lithium cells are UL (Underwriters Laboratories) recognized and non-restricted for transport.
Most battery packs comply with European and US Army specifications.
- **Storage**

The storage area should be clean, cool (not exceeding +30°C), dry and ventilated.

SAFT PRIMARY LITHIUM CHEMISTRIES: SPECIFIC QUALITIES

- **Li-SOCl₂** (LS, LST, LSH cell series)
 - Operating voltage > 3 Volt
 - Ability to operate from -60 to 85°C
 - Non-flammable electrolyte
 - Cells non-pressurized at room temperature
 - Hermeticity guaranteed up to 110°C
 - Unrivaled nominal capacities (LS, LST)

→ "C" cell versions yield longer service lives at low currents and higher transient minimum voltage during pulsing at temperature not exceeding 40°C.
- **Li-SO₂** (G, LO cell series)
 - Non-flammable electrolyte
 - Superior pulse capability
 - Excellent capacity above 1 A
 - Superior power at -40°C
 - Hermeticity guaranteed up to 95°C
 - Wide military acceptance

→ "SHX" cell versions offer superior pulse capability for discharges not exceeding the declared voltage cut-off.
- **Li-MnO₂** (LM cell series)
 - Non-corrosive electrolyte
 - Cells non-pressurized at room temperature
 - Spiral cells with good pulse capability
 - No voltage delay
 - Competitive capacity at high current and low temperature (-40°C)

SAFT LITHIUM CELL SERIES: PERFORMANCE DATA

Data given on following pages relates to batteries aged up to 12 months and properly stored. Consult Saft regarding specific pulse conditions or usage following prolonged storage and/or exposure to extreme temperatures.

- Nominal capacity at +20°C and 2.0 V discharge cut-off (continuous current).
- Maximum recommended continuous current:
 - LS/LST bobbin cells : the current providing 50% of the nominal capacity at +20°C and 2.0 V cut-off.
 - LSH/G/LO/LM spirals : the current that keeps the cells self-heating within safe limits.
- Maximum recommended pulse current : varies according to pulse characteristics (duration, frequency), temperature conditions, cell storage conditions prior to usage and the application's acceptable minimum voltage. Simple numbers could be misleading. Consult Saft.
- Transport status: according to UN model Regulations Ref. ST/SG/AC.10/1 Revision 12 (2001) and Manual of Tests and Criteria Ref. ST/SG/AC.10/1 Revision 3, amended per ST/SG/AC.10/27 Addendum 2 Annex 4 (01/2001)

SAFT Li-SOCl₂

Production site	Size	Open circuit voltage	Nominal voltage	Nominal capacity (drain)	Maximum recommended continuous current	Operating temperature range	Outside diameter max.	Height max.	Weight	UL recognition	Transport status
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Small LS/T bobbin cells

LS 14250	F	½ AA	3.67 V	3.6 V	1.00 Ah (1.5 mA)	40 mA	-60/+85°C*	14.65 mm	24.8 mm	8.9 g	yes	Non-restricted
LST 14250 (ex T 04)	UK	½ AA	3.67 V	3.6 V	1.00 Ah (1.5 mA)	40 mA	-60/+85°C*	14.55 mm	25.10 mm	9.4 g	yes	Non-restricted
LS 14250 C	F	½ AA	3.67 V	3.6 V	1.20 Ah (0.5 mA)	12 mA	-60/+45°C*	14.65 mm	24.8 mm	8.9 g	yes	Non-restricted
LS 14500	F	AA	3.67 V	3.6 V	2.25 Ah (3 mA)	120 mA	-60/+85°C*	14.65 mm	50.3 mm	16.2 g	yes	Non-restricted
LST 14500 (ex T 06)	UK	AA	3.67 V	3.6 V	2.25 Ah (3 mA)	120 mA	-60/+85°C*	14.55 mm	49.80 mm	17.4 g	yes	Non-restricted
LS 14500 C	F	AA	3.67 V	3.6 V	2.75 Ah (1 mA)	25 mA	-60/+45°C*	14.65 mm	50.3 mm	16.2 g	yes	Non-restricted
LST 17330 (ex T 32)	UK	⅔ A	3.67 V	3.6 V	1.70 Ah (3 mA)	80 mA	-60/+85°C*	16.45 mm	33.5 mm	14.4 g	yes	Non-restricted
LS 17500	F	A	3.67 V	3.6 V	3.40 Ah (4 mA)	130 mA	-60/+85°C*	17.0 mm	50.5 mm	21.9 g	yes	Non-restricted

* Cells leakproof up to 120°C

Large LS bobbin cells

LS 26500	F	C	3.67 V	3.6 V	7.6 Ah (5 mA)	170 mA	-60/+85°C*	26.0 mm	49.2 to 50.4 mm**	48 g	yes	Class 9
LS 33600	F	D	3.67 V	3.6 V	16.5 Ah (5 mA)	250 mA	-60/+85°C*	33.3 mm	60.1 to 61.6 mm**	90 g	yes	Class 9
LS 33600 C	F	D	3.67 V	3.6 V	18.5 Ah (1 mA)	80 mA	-60/+45°C*	33.3 mm	60.1 to 61.6 mm**	90 g	yes	Class 9

* Cells leakproof up to 110°C

** Depending on cell finish

LSH spiral cells

LSH 26180	F	⅓ C	3.67 V	3.6 V	1.20 Ah (10 mA)	400 mA	-60/+85°C*	26.2 mm	18.9 mm	24 g	---	Non-restricted
LSH 14	F	C	3.67 V	3.6 V	5.5 Ah (10 mA)	1000 mA	-60/+85°C*	26.0 mm	50.4 mm	51 g	yes	Class 9
LSH 14 "light"	F	C	3.67 V	3.6 V	3.5 Ah (10 mA)	1000 mA	-60/+85°C	26.0 mm	50.4 mm	51 g	---	Non-restricted
LSH 20	F	D	3.67 V	3.6 V	13.0 Ah (15 mA)	1800 mA	-60/+85°C*	33.3 mm	61.6 mm	100 g	yes	Class 9

* Cells leakproof up to 110°C

Cells fitted with individual 5 Amp fuse protection

Li-SOCl₂ MILITARY LITHIUM BATTERY PACKS

	Cell type construction	Open circuit voltage	Nominal voltage	Voltage cut-off	Rated capacity	Maximum dimensions	Weight	Safety features	NATO stock number	Typical applications
PS 31 A	1 LSH 26180	3.67 V	3.5 V	2.0 V	1.0 Ah	26.2 x 18.9 mm	25 g	5 A fuse	6135-14-376-4875	Night vision
PS 38 A	5 LSH 26180	18.0 V	17.5 V	10.0 V	1.0 Ah	110.7 x 37 mm	155 g	5 A fuse	6135-14-389-9050	Laser telemetry
PS 40 A	4 LSH 14	14.7 V	14.0 V	10.0 V	4.6 Ah	108 x 65 x 49 mm	285 g	PTC 1.1 A*	6135-14-420-1760	Radiocommunication (TRPP 11/13)
PS 42 A	2 LSH 20	7.3 V	7.0 V	5.0 V	9.0 Ah	69.9 x 67.2 x 34 mm	230 g	PTC 3.5 A*	6135-14-434-0766	Radiocommunication (TRPP 39)
PS 48 B	5 LSH 20-2	18.3 V	17.5 V	12.6 V	18.0 Ah	212.4 x 72.7 x 68.5 mm	1150 g	PTC 1.85 A*	6135-14-451-7198	Radiocommunication (TRC 350)
PS 52 A	2 LSH 20	7.3 V	7.2 V	5.0 V	12.5 Ah	77.5 x 63.5 x 34.6 mm	225 g	PTC 2.0 A*	6135-14-459-9265	Radiocommunication (Portable PR4G)
PS 53 B	6 LSH 20	22.0 V	21.0 V	15.0 V	12.5 Ah	210.5 x 68.5 x 37.5 mm	720 g	PTC 2.5 A*	6135-14-459-9266	Radiocommunication (Portable PR4G)

*Maximum hold current

Production site	Size	Open circuit voltage	Nominal voltage	Nominal capacity (drain)	Maximum recommended continuous current	Operating temperature range	Outside diameter max.	Height max.	Weight	UL recognition	Transport status
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G/LO spiral cells

G 04	UK	½ AA	3.0 V	2.9 V	450 mAh (50 mA)	250 mA	-60/+70°C*	14.2 mm	27.9 mm	8 g	---	Non-restricted
G 06	UK	AA	3.0 V	2.9 V	950 mAh (100 mA)	1000 mA	-60/+70°C*	14.2 mm	50.3 mm	15 g	---	Non-restricted
G 32	UK	¾ A	3.0 V	2.9 V	800 mAh (80 mA)	750 mA	-60/+70°C*	16.3 mm	34.5 mm	12 g	---	Non-restricted
G 36	UK	"long" A	3.0 V	2.9 V	1700 mAh (100 mA)	1500 mA	-60/+70°C*	16.3 mm	57.7 mm	18 g	---	Non-restricted
LO 34 SX	USA	⅓ C	3.0 V	2.9 V	860 mAh (80 mA)	1000 mA	-60/+70°C*	25.9 mm	20.3 mm	18 g	yes	Non-restricted
LO 35 SX	USA	⅔ C	3.0 V	2.9 V	2000 mAh (120 mA)	2000 mA	-60/+70°C*	25.9 mm	35.9 mm	30 g	yes	Class 9
G 52	UK	C	3.0 V	2.9 V	3750 mAh (150 mA)	2500 mA	-60/+70°C*	25.6 mm	49.5 mm	47 g	---	Class 9
LO 29 SHX	USA	C	3.0 V	2.9 V	3750 mAh (270 mA)	2500 mA	-60/+70°C*	25.9 mm	50.4 mm	40 g	yes	Class 9
G 54	UK	¼ C	3.0 V	2.9 V	5000 mAh (200 mA)	2500 mA	-60/+70°C*	25.6 mm	60.2 mm	58 g	---	Class 9
LO 43 SHX	USA	¼ C	3.0 V	2.9 V	5000 mAh (200 mA)	2500 mA	-60/+70°C*	25.9 mm	59.3 mm	53 g	yes	Class 9
LO 40 SHX	USA	⅔ Thin" D	3.0 V	2.9 V	3500 mAh (120 mA)	2000 mA	-60/+70°C*	29.1 mm	41.6 mm	40 g	yes	Class 9
LO 30 SHX	USA	"Thin" D	3.0 V	2.9 V	5750 mAh (200 mA)	3000 mA	-60/+70°C*	29.1 mm	59.9 mm	63 g	yes	Class 9
G 20	UK	D	3.0 V	2.9 V	7750 mAh (250 mA)	3000 mA	-60/+70°C*	33.3 mm	61.0 mm	88 g	---	Class 9
LO 26 SX	USA	D	3.0 V	2.9 V	7750 mAh (250 mA)	3000 mA	-60/+70°C*	34.2 mm	59.3 mm	85 g	yes	Class 9
LO 26 SHX	USA	D	3.0 V	2.9 V	7500 mAh (1000 mA)	4000 mA	-60/+70°C*	34.2 mm	59.3 mm	85 g	yes	Class 9
LO 25 SX	USA	"Fat" D	3.0 V	2.9 V	8000 mAh (270 mA)	2500 mA	-60/+70°C*	39.5 mm	50.3 mm	96 g	yes	Class 9
LO 39 SHX	USA	F	3.0 V	2.9 V	11000 mAh (300 mA)	3000 mA	-60/+70°C*	30.7 mm	99.4 mm	125 g	yes	Class 9
G 22	UK	DD	3.0 V	2.9 V	16500 mAh (500 mA)	3000 mA	-60/+70°C*	33.3 mm	120.6 mm	175 g	---	Class 9
G 62	UK	"Long Fat DD"	3.0 V	2.9 V	34000 mAh (1000 mA)	3000 mA	-60/+70°C*	41.7 mm	141.0 mm	300 g	---	Class 9

* Cells leakproof up to 95°C

SAFT Li-SO₂ MILITARY LITHIUM BATTERY PACKS

Cell type construction	Open circuit voltage	Nominal voltage	Voltage cut-off	Rated capacity	Maximum dimensions	Weight	NATO stock number	Typical applications
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BA 5112/U	4 LO 35 SX	11.8 V	11.2 V	8.0 V	2.0 Ah	77.8 x 57.2 x 39.1 mm	180 g	6135-01-235-4168	Radiocommunication (PRC 112)
BA 5557/U	5 LO 35 SX-2	14.7 V/ 29.5 V	14.0 V/ 28.0 V	10.0 V/ 20.0 V	4 Ah/2 Ah	100.1 x 106.3 x 37.3 mm	500 g	6135-01-088-2707	Radiocommunication
BA 5567/U	1 LO 34 SX	2.95 V	2.9 V	2.0 V	0.86 Ah	25.9 x 19.9 mm	16 g	6135-01-090-5363	Night vision
BA 5588/U	5 LO 40 SX	14.7 V	14.0 V	10.0 V	3.5 Ah	96 x 90 x 31 mm	295 g	6135-00-088-2708	Radiocommunication (PRC 128)
BA 5590/U (2 sets of terminals)	5 LO 26 SX-2	14.7 V 29.5 V	14.0 V 28.0 V	10.0 V 20.0 V	7.5 Ah 15.0 Ah	127 x 111.8 x 62 mm	1020 g	6135-01-036-3495	Radiocommunication (PRC 104/119)
BA 5598/U	5 LO 25 SX	14.7 V	14.0 V	14.0 V	8.0 Ah	120.7 x 92 x 54 mm	680 g	6135-01-034-2239	Radiocommunication (PRC 25/74/77)
BA 5599/U	3 LO 26 SX	8.8 V	8.4 V	6.0 V	7.5 Ah	152 x 38 x 64 mm	450 g	6135-01-034-2239	Radio tester
BA 5600/U	3 LO 26 SX	8.8 V	8.4 V	4.0 V	7.5 Ah	185.9 x 39.4 mm	360 g	6135-01-168-2944	Communication terminal AN/PSC 2/cap
BA 5790/U	5 LO 26 SX	14.7 V	14.0 V	10 V	7.5 Ah	186.5 x 35.7 x 66.7 mm	630 g	N/A	Radiocommunication
BA 5791/U	5 LO 26 SX/2	14.7 V	14.0 V	10 V	15 Ah	186.5 x 70.0 x 65.3 mm	1.2 kg	N/A	Radiocommunication
BA 5800/U	2 LO 26 SX	5.9 V	5.6 V	4.0 V	7.5 Ah	128.5 x 35.5 mm	220 g	6135-99-798-9851	Compact Air Supply Unit (CASU), GPS
BA 5847/U	2 LO 26 SX	5.9 V	5.4 V	4.0 V	7.5 Ah	95 x 64.8 x 38 mm	240 g	6135-01-090-5364	Radiocommunication Mine detector
BT 5313/U	9 LO 26 SHX	26.5 V	25.2 V	18 V	7.2 Ah	Special	1.1 kg	N/A	Missile launcher
Li/3	3 LO 26 SX	8.8 V	8.4 V	6.0 V	7.5 Ah	110 x 42 x 26.2 mm	450 g	6135-14-383-9768	Missile launcher
G6-104 (C,D,E,F,G,H)	2 G20	5.9 V	5.6 V	4.0 V	7.5 Ah	128.5 x 35.5 mm	200 g	-	CAM
G6-105	2 G52	5.9 V	5.6 V	4.0 V	3.2 Ah	55 x 28.1 x 56 mm	110 g	6135-99-658-9085	Aircraft sonde
G9-124	3 G20	8.8 V	8.4 V	6.0 V	7.5 Ah	110 x 42 x 83 mm	370 g	6135-14-383-9768	Missile
G15-114	5 G06-2	14.7 V	14.0 V	9.6 V	1.9 Ah	90.6 x 40.3 x 71 mm	270 g	6135-99-795-4351	Radiocommunication
G15-127	2x5 G62	2x14.7 V	2x14.0 V	2x10.0 V	34 or 68 Ah	216 x 152 x 92 mm	3.5 kg	6135-99-794-2896	-
G18-115	6 G20	17.5 V	16.8 V	12.0 V	7.5 Ah	131.6 x 66.8 x 128 mm	0.85 kg	6135-99-795-4350	Radiocommunication
G30-101	10 G20	29.3 V	28.0 V	20.0 V	7.5 Ah	184.5 x 73.5 x 80 mm	1.5 kg	6135-99-747-4430	Radiocommunication
G30-102/B	10 G22	29.3 V	28.0 V	20.0 V	16 Ah	184 x 72.5 x 133 mm	2.5 kg	6135-99-840-0109	Radiocommunication
XSG 1493/1	5 G32	14.7 V	14.0 V	10.0 V	0.85 Ah	78.5 x 37.2 x 40 mm	170 g	-	Personal locator beacon

Production site	Size	Open circuit voltage	Nominal voltage	Nominal capacity (drain)	Maximum recommended continuous current	Operating temperature range	Outside diameter max.	Height max.	Weight	UL recognition	Transport status
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LM button cells

LM 2032	F	20 x 3.2 mm	3.3 V	3.0 V	200 mAh (0.2 mA)	3 mA	-20/+60°C	20.0 mm	3.2 mm	2.9 g	yes	Non-restricted
LM 2430	F	24.5 x 3 mm	3.3 V	3.0 V	285 mAh (0.2 mA)	3 mA	-20/+60°C*	24.5 mm	3.0 mm	4.0 g	yes	Non-restricted
LM 2450	F	24.5 x 5 mm	3.3 V	3.0 V	540 mAh (0.2 mA)	3 mA	-20/+60°C	24.5 mm	5.0 mm	6.0 g	yes	Non-restricted

* Operating temperature range extended to -20/+70°C for the resin-encapsulated Memoguard 40 LH or LF 220 versions

LM spiral cells

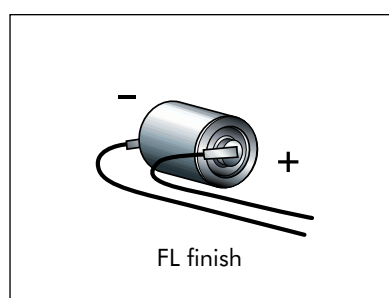
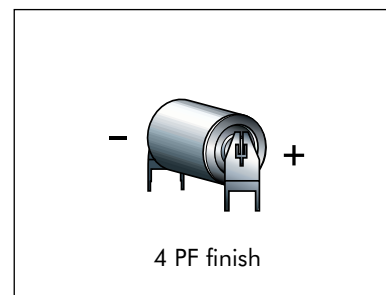
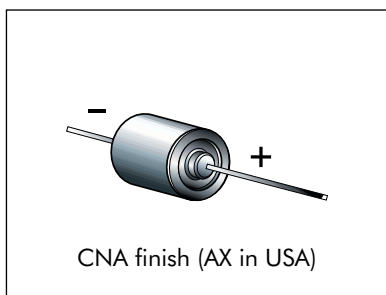
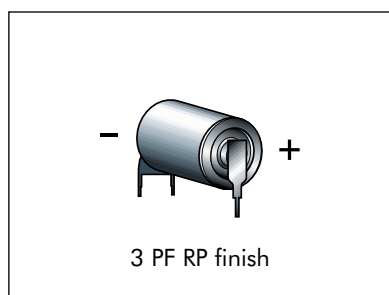
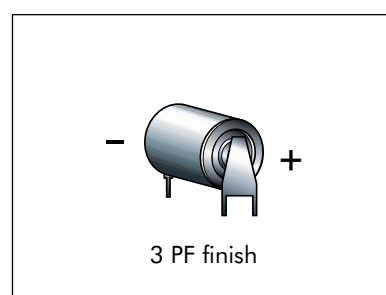
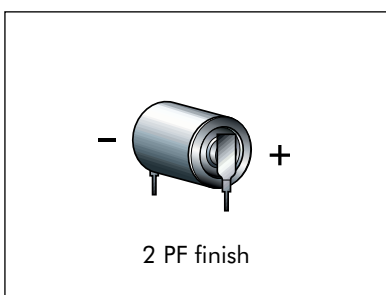
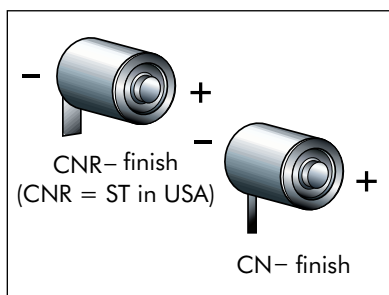
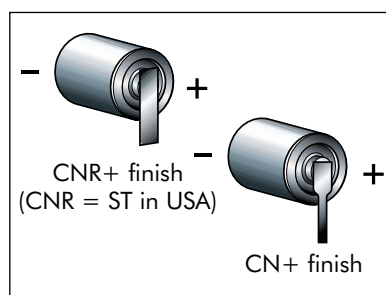
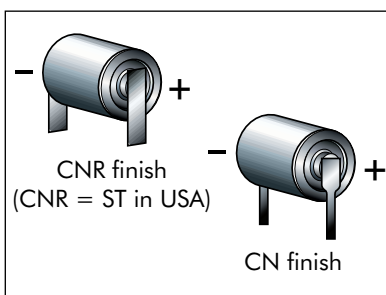
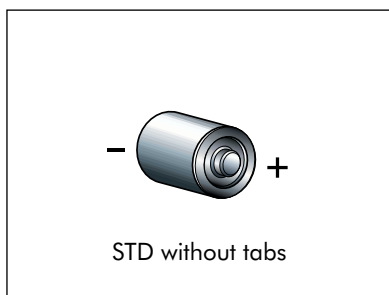
LM 14250	USA	1/2 AA	3.3 V	3.0 V	450 mAh (41 mA to 2.0 V)	400 mA	-40/+70°C*	14.7 mm	26.0 mm	9.0 g	---	Non-restricted
LM 17130	USA	1/3 A	3.3 V	3.0 V	500 mAh (4.5 mA to 2.0 V)	300 mA	-40/+70°C*	16.7 mm	16.6 mm	8.0 g	---	Non-restricted
LM 22150	USA	1/3 sub-C	3.3 V	3.0 V	900 mAh (40 mA to 2.0 V)	500 mA	-40/+70°C*	22.8 mm	17.3 mm	15.0 g	---	Non-restricted
LM 26500	UK	C	3.3 V	3.0 V	4500 mAh (500 mA)	1000 mA	-40/+70°C*	25.6 mm	51.0 mm	60 g	---	Class 9
LM 26600	UK	5/4 C	3.3 V	3.0 V	5500 mAh (500 mA)	1200 mA	-40/+70°C*	25.6 mm	61.5 mm	72 g	---	Class 9
LM 33600	UK	D	3.3 V	3.0 V	10500 mAh (1000 mA)	3000 mA	-40/+70°C*	34.0 mm	61.3 mm	116 g	---	Class 9

* Cells leakproof up to 80°C

Li-MnO₂ MILITARY LITHIUM BATTERY PACKS

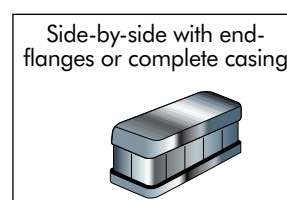
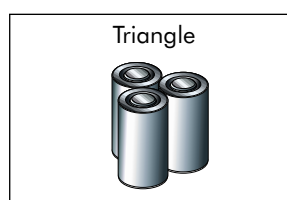
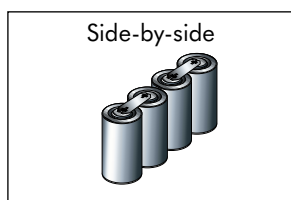
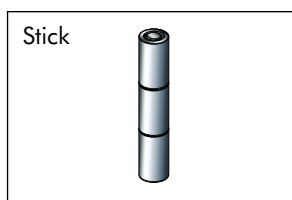
	Cell type construction	Open circuit voltage	Nominal voltage	Voltage cut-off	Nominal capacity	Maximum dimensions	Weight	NATO stock number	Typical applications
BA 5368/U	4 LM 22150	13.2 V	12.0 V	9.0 V	900 mAh	76.2 x 26.9 mm	145 g	6135-01-455-7947	Radiocommunication (PRC-90-103-106-195)
BA 5372/U	2 LM 17130	6.6 V	6.0 V	4.0 V	500 mAh	16.5 x 33.0 mm	20 g	6135-01-214-6441	Radiocommunication (SINCGARS)

EXAMPLES OF STANDARD INDIVIDUAL CELL TABBING ARRANGEMENTS⁽¹⁾⁽²⁾



(1) other cell finishes are available upon request
(2) check availability and dimensions of tabbing arrangement for considered cell

EXAMPLES OF STANDARD BATTERY PACKS CONFIGURATIONS



SERVING YOUR NEEDS AROUND THE WORLD

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