

# Primary lithium batteries

## Selector guide



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# Saft lithium batteries

## meeting your needs...

*For more than 32 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.*

Saft is a world specialist in the design and manufacture of high-tech batteries for professional, industrial, space and military uses. With approximately 3,900 employees worldwide, Saft is present in 18 countries and operates two R&D centers.

Five manufacturing sites and an extensive sales network enable the Saft Lithium Battery Division to serve its customers worldwide with a product range that covers the three main primary lithium chemistries of today.

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

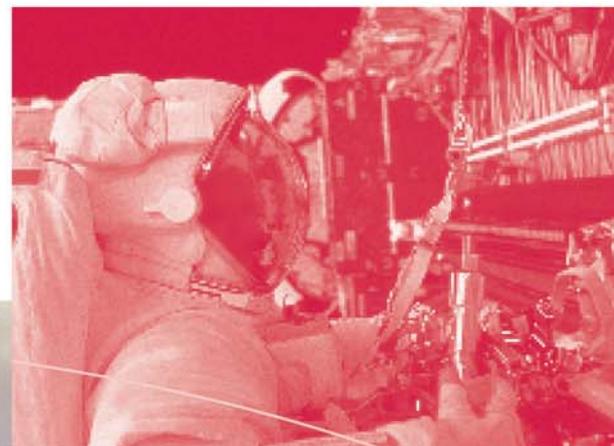
Lithium is a light metal which exhibits an exceptional specific capacity (3.86 Ah/gram) and unique electrochemical characteristics.

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

Three lithium chemistries are currently available:

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





# ...exceeding your expectations

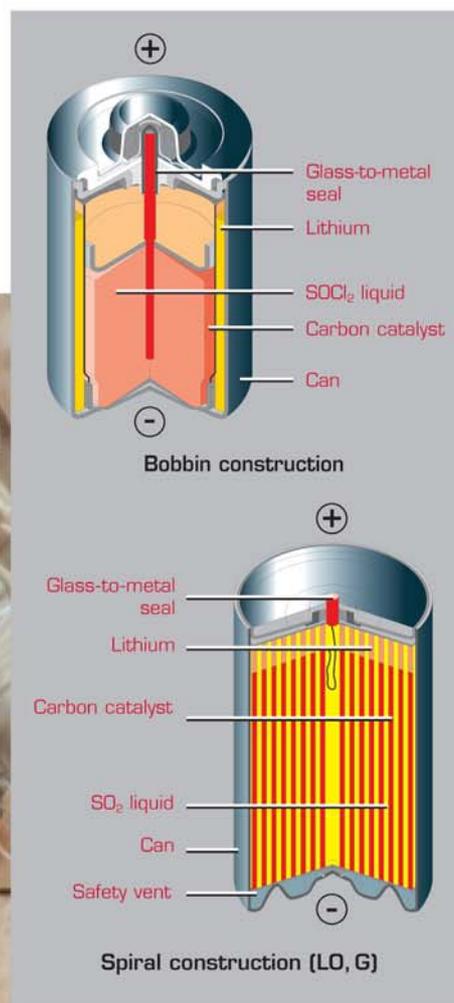
The LS cells are *cylindrical* and based on the high-energy concentric "bobbin" electrode configuration. They are available in *standard* and "W" versions according to the elevated temperature characteristics of the envisioned applications.

The LSH, LO/G and LM/M cells are also *cylindrical* but use the power-optimized "coiled" and "spiral" electrode constructions. The Li-SO<sub>2</sub> cells are available in several versions: "SX" and "G" series, "SHX" high pulse capability series and "SXC" high capacity series.

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, LSH, LO/G and LM/M 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.



## 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 | GPS/GSM tracking |
|-------------------------------------|----------------|------------------|----------------------|-----------------|----------------------------|------------------------|---------------------|--------------------------|-----------------------|------------------------|------------------|-------------------|--------------------------|------------------|
| LM/M spirals                        |                |                  | ○                    | ●               |                            | ●                      | ●                   | ●                        | ●                     | ●                      |                  | ●                 | ●                        | ●                |
| LS small bobbins (½ AA, AA, ¾ A, A) | ●              | ●                | ●                    | ●               | ●                          | ●                      |                     | ●                        | ●                     |                        | ●                |                   | ●                        | ●                |
| LS large bobbins (C, D)             | ●              |                  | ●                    | ●               |                            | ○                      |                     | ●                        |                       |                        |                  | ●                 | ●                        |                  |
| LSH spirals                         |                |                  | ○                    | ●               |                            | ○                      | ●                   | ●                        | ●                     |                        | ●                | ●                 | ●                        | ●                |
| LO/G spirals                        |                |                  | ○                    | ●               |                            | ●                      | ●                   | ●                        | ●                     | ●                      |                  | ●                 | ●                        | ●                |

● recommended

○ possible

# Key features

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## Primary cells and batteries are not rechargeable.

- **High and stable operating voltage**
  - Above 3 V for LS and LSH cells.
  - Above 2 V for LO/G and LM/M cells.
- **Wide current capability range**

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

From  $-60^{\circ}\text{C}$  up to  $+85^{\circ}\text{C}$  (Standard cells) depending on cell type, current drain and environment conditions.
- **High operating temperature – spiral cell series**

Operating safely and reliably up to  $150^{\circ}\text{C}$ .
- **Long shelf life**

Capacity loss in storage at  $+20^{\circ}\text{C}$  below 1% (LS bobbins) and 3% (LSH, LO/G, LM/M spirals) per year.
- **Extended operating life**

Typically above 5 years, and up to 20 years for some applications.
- **High energy densities**

3-10 times greater than the non-lithium systems.
- **Excellent behavior in humid environments**

Corrosion-free stainless steel cell envelopes.
- **Disposal**

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

Most of Saft's lithium cells are UL (Underwriters Laboratories) and IEC 60086-4 recognized, and non-restricted for transport. Most battery packs comply with European and US Army standards. Several LS cell models comply with the IEC 60079-11 "Intrinsic Safety" specification for ATEX applications.
- **Storage**

The storage area should be clean, cool (preferably not exceeding  $+30^{\circ}\text{C}$ ), dry and ventilated.
- **Logistic**

The small LS cells are manufactured in France, UK and China.

## Saft primary lithium chemistries: specific qualities

- **Li-SOCl<sub>2</sub>**  
(LS, LSH cell series)
  - Bobbin, coil or spiral construction
  - Operating voltage  $> 3\text{ V}$
  - Ability to operate from  $-60$  to  $+85^{\circ}\text{C}$
  - Non-flammable electrolyte
  - Cells non-pressurized at room temperature
  - Hermeticity guaranteed up to  $+120^{\circ}\text{C}$
  - Unrivalled nominal capacities (LS)
  - High temperature LSH cell series up to  $+150^{\circ}\text{C}$
  - ▶ The LS "W" cell versions are recommended for use in applications with widely fluctuating temperature (up to  $+95^{\circ}\text{C}$ ), such as electronic toll collection.
  - ▶ The LO "SHX" cell versions offer superior pulse capability for discharges not exceeding the declared voltage cut-off.
- **Li-SO<sub>2</sub>**  
(LO/G cell series)
  - Spiral construction
  - Non-flammable electrolyte
  - Superior pulse capability
  - Excellent capacity above 1 A
  - Superior power at  $-40^{\circ}\text{C}$
  - Hermeticity guaranteed up to  $+95^{\circ}\text{C}$
  - Wide military acceptance
- **Li-MnO<sub>2</sub>**  
(LM/M cell series)
  - Spiral construction
  - Non-corrosive electrolyte
  - Cells non-pressurized at room temperature
  - Spiral cells with good pulse capability
  - Minimal voltage delay
  - Competitive capacity at high current and low temperature ( $-40^{\circ}\text{C}$ )



## Saft lithium cell series: performance data

Enclosed data 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 V discharge cut-off (continuous current).
- 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. The use of parallel capacitor to enhance the voltage at the beginning of pulses might be recommended. Consult Saft.
- Transport status: according to UN Model Regulations Ref. ST/SG/AC.10/1 Revision 15 (2007) and Manual of Tests and Criteria Ref. ST/SG/AC.10/11 Revision 4, 2003.

## Examples of standard individual cell tabbing arrangements



Other cell finishes are available upon request. Check availability and dimensions of tabbing arrangement for considered cell.

## Examples of standard battery packs configurations



# Primary lithium batteries

## Li-SOCl<sub>2</sub> range



### Li-SOCl<sub>2</sub> cells

| Production site | Size | Open circuit voltage | Nominal voltage | Nominal capacity (drain) [2.0 V cut-off] | Maximum recommended continuous current | Operating temperature range | Outside diameter max. | Height max. | Typical weight | UL recognition | Transport status |
|-----------------|------|----------------------|-----------------|--|--|-----------------------------|-----------------------|-------------|----------------|----------------|------------------|
|-----------------|------|----------------------|-----------------|--|--|-----------------------------|-----------------------|-------------|----------------|----------------|------------------|

#### Small LS cells

|            |          |      |        |       |               |        |             |          |          |        |     |                |
|------------|----------|------|--------|-------|---------------|--------|-------------|----------|----------|--------|-----|----------------|
| LS 14250   | UK-F-PRC | ½ AA | 3.67 V | 3.6 V | 1.2 Ah (1 mA) | 35 mA  | -60/+ 85°C* | 14.55 mm | 25.15 mm | 8.9 g  | yes | Non-restricted |
| LS 14250W  | F-PRC    | ½ AA | 3.67 V | 3.6 V | 1.2 Ah (1 mA) | 20 mA  | -60/+ 95°C* | 14.55 mm | 25.15 mm | 8.9 g  | yes | Non-restricted |
| LS 14500   | UK-F-PRC | AA   | 3.67 V | 3.6 V | 2.6 Ah (2 mA) | 50 mA  | -60/+ 85°C* | 14.55 mm | 50.30 mm | 16.7 g | yes | Non-restricted |
| LS 14500Ex | UK-PRC   | AA   | 3.67 V | 3.6 V | 2.6 Ah (2 mA) | 50 mA  | -60/+ 85°C* | 14.55 mm | 50.30 mm | 16.7 g | yes | Non-restricted |
| LS 14500W  | F-PRC    | AA   | 3.67 V | 3.6 V | 2.6 Ah (1 mA) | 30 mA  | -60/+ 95°C* | 14.55 mm | 50.30 mm | 16.7 g | yes | Non-restricted |
| LS 17330   | UK       | ¾ A  | 3.67 V | 3.6 V | 2.1 Ah (3 mA) | 25 mA  | -60/+ 85°C* | 16.50 mm | 33.40 mm | 14.4 g | yes | Non-restricted |
| LS 17500   | F        | A    | 3.67 V | 3.6 V | 3.6 Ah (3 mA) | 100 mA | -60/+ 85°C* | 17.13 mm | 50.90 mm | 21.9 g | yes | Non-restricted |

\*Cells leakproof up to +120°C

#### Large LS cells

|            |   |   |        |       |                |        |             |          |                    |      |     |         |
|------------|---|---|--------|-------|----------------|--------|-------------|----------|--------------------|------|-----|---------|
| LS 26500   | F | C | 3.67 V | 3.6 V | 7.7 Ah (4 mA)  | 150 mA | -60/+ 85°C* | 26.00 mm | 49.1 to 50.4 mm*** | 48 g | yes | Class 9 |
| LS 33600** | F | D | 3.67 V | 3.6 V | 17.0 Ah (5 mA) | 250 mA | -60/+ 85°C* | 33.40 mm | 60.2 to 61.6 mm*** | 90 g | yes | Class 9 |

\*Cells leakproof up to +120°C

\*\*Low Magnetic cell versions available

\*\*\*Depending on cell finish

#### LSH spiral cells

|                |   |    |        |       |                   |        |             |          |          |        |     |                |
|----------------|---|----|--------|-------|-------------------|--------|-------------|----------|----------|--------|-----|----------------|
| LSH 14         | F | C  | 3.67 V | 3.6 V | 5.8 Ah (15 mA)    | 1.3 A  | -60/+ 85°C* | 26.00 mm | 50.40 mm | 51 g   | yes | Class 9        |
| LSH 14 "light" | F | C  | 3.67 V | 3.6 V | 3.6 Ah (15 mA)    | 1.3 A  | -60/+ 85°C  | 26.00 mm | 50.40 mm | 51 g   | -   | Non-restricted |
| LSH 20**       | F | D  | 3.67 V | 3.6 V | 13.0 Ah (15 mA)   | 1.8 A  | -60/+ 85°C* | 33.40 mm | 61.60 mm | 100 g  | yes | Class 9        |
| LSH 20-150     | F | D  | 3.67 V | 3.6 V | 14.0Ah (300mA)*** | 300 mA | -40/+ 150°C | 32.05 mm | 61.70 mm | 104.5g | -   | Class 9        |
| LSH DD-150     | F | DD | 3.67 V | 3.6 V | 28.0Ah (600mA)*** | 600 mA | -40/+ 150°C | 33.0 mm  | 125.5 mm | 215 g  | -   | Class 9        |

\*Cells leakproof up to +120°C

\*\*LSH 20 HTS cell version available

\*\*\*Nominal capacity at +150°C

All LSH cells are fitted with individual 5 Amp fuse protection

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Their internal impedance may rise versus time, especially in case of exposure at elevated temperature.

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## Li-SOCl<sub>2</sub> Military battery packs

|                | Cell type construction* | Open circuit voltage | Nominal voltage | Voltage cut-off | Rated capacity | Maximum dimensions     | Typical weight | Safety features | NATO Stock Number (NSN) | Typical applications               |
|----------------|-------------------------|----------------------|-----------------|-----------------|----------------|------------------------|----------------|-----------------|-------------------------|------------------------------------|
| <b>PS 40 A</b> | 4s1p<br>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)    |
| <b>PS 42 A</b> | 2s1p<br>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)       |
| <b>PS 48 B</b> | 5s2p<br>LSH 20          | 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)       |
| <b>PS 52 A</b> | 2s1p<br>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) |
| <b>PS 53 B</b> | 6s1p<br>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) |

\* Xs Yp = Y parallel branches of X cells in series per branch

\*\* Maximum hold current

## Li-SOCl<sub>2</sub> Civil battery packs

|                     | Cell type construction* | Open circuit voltage | Nominal voltage | Rated capacity | Maximum dimensions    | Typical weight | Typical applications  |
|---------------------|-------------------------|----------------------|-----------------|----------------|-----------------------|----------------|---|
| <b>LS 14250 MLB</b> | 1s1p<br>LS 14250        | 3.67 V               | 3.6 V           | 1.2 Ah         | 16.8 x 28.6 mm        | 15 g           | Metering, professional electronics                                  |
| <b>LS 9V</b>        | 3s1p<br>LS 14250        | 11.0 V               | 10.8 V          | 1.2 Ah         | 49.1 x 46.8 x 26.8 mm | 29 g           | Memory back-up, metering, smoke detectors, professional electronics |
| <b>Lithopack</b>    | 2s1p<br>LS 14500        | 7.3 V                | 7.2 V           | 2.6 Ah         | 56.6 x 31.6 x 17.3 mm | 34 g           | Memory back-up, metering, professional electronics                  |

Primary cells and batteries are not rechargeable.

This data sheet is an insert part of the Primary lithium batteries Selector Guide (ref 31048-2), where complementary information and data on features, safety and storage can be found.

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# Primary lithium batteries

## Li-SO<sub>2</sub> range



### Li-SO<sub>2</sub> cells

| Production site | Size | Open circuit voltage | Nominal voltage | Nominal capacity (drain) (2.0 V cut-off) | Maximum recommended continuous current | Operating temperature range | Outside diameter max. | Height max. | Weight | UL recognition | Transport status |
|-----------------|------|----------------------|-----------------|--|--|-----------------------------|-----------------------|-------------|--------|----------------|------------------|
|-----------------|------|----------------------|-----------------|--|--|-----------------------------|-----------------------|-------------|--------|----------------|------------------|

#### G/LO spiral cells

|           |     |               |       |       |                  |        |            |          |          |       |     |                |
|-----------|-----|---------------|-------|-------|------------------|--------|------------|----------|----------|-------|-----|----------------|
| G 04/3    | UK  | ½ AA          | 3.0 V | 2.8 V | 0.45 Ah (50 mA)  | 0.25 A | -60/+70°C* | 14.2 mm  | 27.9 mm  | 8 g   | -   | Non-restricted |
| G 06/2    | UK  | AA            | 3.0 V | 2.8 V | 0.95 Ah (80 mA)  | 0.5 A  | -60/+70°C* | 14.2 mm  | 50.3 mm  | 15 g  | -   | Non-restricted |
| G 32/3    | UK  | ⅔ A           | 3.0 V | 2.8 V | 0.8 Ah (80 mA)   | 0.75 A | -60/+70°C* | 16.3 mm  | 34.5 mm  | 12 g  | -   | Non-restricted |
| G 36/2    | UK  | "long" A      | 3.0 V | 2.8 V | 1.7 Ah (80 mA)   | 1.5 A  | -60/+70°C* | 16.3 mm  | 57.7 mm  | 18 g  | -   | Non-restricted |
| LO 34 SX  | USA | ⅓ C           | 3.0 V | 2.8 V | 1.0 Ah (80 mA)   | 1.0 A  | -60/+70°C* | 25.9 mm  | 20.3 mm  | 16 g  | yes | Non-restricted |
| LO 35 SX  | USA | ⅔ C           | 3.0 V | 2.8 V | 2.2 Ah (650 mA)  | 2.0 A  | -60/+70°C* | 25.9 mm  | 35.9 mm  | 30 g  | yes | Non-restricted |
| G 52/3    | UK  | C             | 3.0 V | 2.8 V | 3.2 Ah (1.0 A)   | 2.5 A  | -60/+70°C* | 25.6 mm  | 49.5 mm  | 47 g  | -   | Class 9        |
| LO 29 SHX | USA | C             | 3.0 V | 2.8 V | 3.75 Ah (0.25 A) | 2.5 A  | -60/+70°C* | 25.6 mm  | 50.4 mm  | 40 g  | yes | Class 9        |
| G 54/3    | UK  | ¼ C           | 3.0 V | 2.8 V | 5.0 Ah (0.2 A)   | 2.5 A  | -60/+70°C* | 25.6 mm  | 60.2 mm  | 58 g  | -   | Class 9        |
| LO 43 SHX | USA | ¼ C           | 3.0 V | 2.8 V | 5.0 Ah (0.2 A)   | 2.5 A  | -60/+70°C* | 26.0 mm  | 59.2 mm  | 53 g  | yes | Class 9        |
| LO 40 SX  | USA | ⅔ "Thin" D    | 3.0 V | 2.8 V | 3.5 Ah (0.12 A)  | 2.0 A  | -60/+70°C* | 28.95 mm | 42.29 mm | 40 g  | yes | Class 9        |
| LO 30 SHX | USA | "Thin" D      | 3.0 V | 2.8 V | 5.75 Ah (0.2 A)  | 3.0 A  | -60/+70°C* | 29.1 mm  | 59.9 mm  | 63 g  | yes | Class 9        |
| G 26      | UK  | D             | 3.0 V | 2.8 V | 7.75 Ah (0.25 A) | 2.5 A  | -60/+70°C* | 34.5 mm  | 59.8 mm  | 85 g  | -   | Class 9        |
| LO 26 SX  | USA | D             | 3.0 V | 2.8 V | 7.75 Ah (0.25 A) | 2.5 A  | -60/+70°C* | 34.2 mm  | 59.3 mm  | 85 g  | yes | Class 9        |
| LO 26 SXC | USA | D             | 3.0 V | 2.8 V | 9.2 Ah (0.25 A)  | 2.5 A  | -60/+70°C* | 34.2 mm  | 59.3 mm  | 85 g  | -   | Class 9        |
| LO 26 SHX | USA | D             | 3.0 V | 2.8 V | 7.5 Ah (1.0 A)   | 4.0 A  | -60/+70°C* | 34.2 mm  | 59.3 mm  | 85 g  | yes | Class 9        |
| LO 25 SX  | USA | "Fat" D       | 3.0 V | 2.8 V | 8.0 Ah (0.27 A)  | 2.5 A  | -60/+70°C* | 39.5 mm  | 50.3 mm  | 96 g  | yes | Class 9        |
| LO 39 SHX | USA | F             | 3.0 V | 2.8 V | 11.5 Ah (1.0 A)  | 3.0 A  | -60/+70°C* | 31.9 mm  | 100.3 mm | 125 g | yes | Class 9        |
| G 22/6    | UK  | DD            | 3.0 V | 2.8 V | 16.5 Ah (0.5 A)  | 3.0 A  | -60/+70°C* | 33.3 mm  | 120.6 mm | 175 g | -   | Class 9        |
| G 62/1    | UK  | "Long Fat DD" | 3.0 V | 2.8 V | 34.0 Ah (1.0 A)  | 3.0 A  | -60/+70°C* | 41.7 mm  | 141.0 mm | 300 g | -   | Class 9        |

\* Cells leakproof up to +85°C

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## Li-SO<sub>2</sub> Military battery packs

| Cell type construction*              | Open circuit voltage  | Nominal voltage   | Voltage cut-off   | Rated capacity    | Maximum dimensions | Typical weight          | NATO Stock Number (NSN) | Typical applications |   |
|--------------------------------------|-----------------------|-------------------|-------------------|-------------------|--------------------|-------------------------|-------------------------|----------------------|---|
| BA 5112 A/U                          | 4s1p<br>LO 35 SX      | 12.0 V            | 11.2 V            | 8.0 V             | 2.3 Ah             | 77.8 x 57.2 x 39.1 mm   | 180 g                   | 6135-01-235-4168     | Radiocommunication (PRC 112)                              |
| BA 5557 A/U                          | 5s1p x 2<br>LO 35 SX  | 15.0 V/<br>30.0 V | 14.0 V/<br>28.0 V | 10.0 V/<br>20.0 V | 4.4 Ah/<br>2.2 Ah  | 100.1 x 106.3 x 37.3 mm | 500 g                   | 6135-01-088-2707     | Radiocommunication  |
| BA 5567 A/U                          | 1s1p<br>LO 34 SX      | 3.0 V             | 2.8 V             | 2.0 V             | 1.0 Ah             | 25.9 x 19.9 mm          | 20 g                    | 6135-01-090-5363     | Night vision  |
| BA 5588 A/U                          | 5s1p<br>LO 40 SX      | 15.0 V            | 13.5 V            | 11.0 V            | 3.5 Ah             | 96 x 90 x 31 mm         | 295 g                   | 6135-00-088-2708     | Radiocommunication (AN/PRC 128)                           |
| BA 5590 A/U                          | 5s1p x 2<br>LO 26 SX  | 15.0 V<br>30.0 V  | 13.5 V<br>27.0 V  | 10.0 V<br>20.0 V  | 15.0 Ah<br>7.5 Ah  | 127 x 111.8 x 62.2 mm   | 1020 g                  | 6135-01-523-3037     | Radiocommunication (with SOCI**) (AN/PRC/104/113/117/119) |
| BA 5590 B/U<br>(2 sets of terminals) | 5s1p x 2<br>LO 26 SX  | 15.0 V<br>30.0 V  | 13.5 V<br>27.0 V  | 10.0 V<br>20.0 V  | 15.0 Ah<br>7.5 Ah  | 127 x 111.8 x 62.2 mm   | 1020 g                  | 6135-01-036-3495     | Radiocommunication (AN/PRC 104/119)                       |
| BA 5590 HC                           | 5s1p x 2<br>LO 26 SXC | 15.0 V<br>30.0 V  | 13.5 V<br>27.0 V  | 10.0 V<br>20.0 V  | 18.2 Ah<br>9.1 Ah  | 127 x 111.8 x 62.2 mm   | 1020 g                  | TBD                  | Radiocommunication (AN/PRC 104/113/117/119)               |
| BA 5598 A/U                          | 5s1p<br>LO 25 SX      | 15.0 V            | 13.5 V            | 10.0 V            | 7.5 Ah             | 120.7 x 92 x 54 mm      | 680 g                   | 6135-01-034-2239     | Radiocommunication (PRC 25/74/77)                         |
| BA 5599 A/U                          | 3s1p<br>LO 26 SX      | 9.0 V             | 8.1 V             | 6.0 V             | 7.5 Ah             | 152 x 38 x 64 mm        | 450 g                   | 6135-01-069-8575     | Radio tester  |
| BA 5600 A/U                          | 3s1p<br>LO 26 SX      | 9.0 V             | 8.1 V             | 6.0 V             | 7.5 Ah             | 185.9 x 39.4 mm         | 360 g                   | 6135-01-168-2944     | Communication terminal AN/PSC 2/cap                       |
| BA 5800 A/U                          | 2s1p<br>LO 26 SX      | 6.0 V             | 5.3 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 B/U                          | 2s1p<br>LO 26 SX      | 6.0 V             | 5.3 V             | 4.0 V             | 7.5 Ah             | 95 x 64.8 x 38 mm       | 220 g                   | 6135-01-090-5364     | Radiocommunication Mine detector                          |
| BT 5313                              | 9s1p<br>LO 26 SHX     | 27.0 V            | 25.2 V            | 18.0 V            | 7.2 Ah             | Special                 | 1100 g                  | N/A                  | Missile launcher  |
| BT 5790                              | 5s1p<br>LO 26 SX      | 15.0 V            | 14.0 V            | 10.0 V            | 7.5 Ah             | 186.5 x 35.7 x 66.7 mm  | 630 g                   | N/A                  | Radiocommunication  |
| BT 5791                              | 5s2p<br>LO 26 SX      | 15.0 V            | 14.0 V            | 10.0 V            | 15.0 Ah            | 186.5 x 70.0 x 65.3 mm  | 1200 g                  | N/A                  | Radiocommunication  |
| G 6-104<br>(/C,D,E,F,G,H)            | 2s1p<br>G20           | 6.0 V             | 5.6 V             | 4.0 V             | 7.5 Ah             | 128.5 x 35.5 mm         | 200 g                   | -                    | CAM   |
| G 6-105                              | 2s1p<br>G52           | 6.0 V             | 5.6 V             | 4.0 V             | 3.2 Ah             | 55 x 28.1 x 56 mm       | 110 g                   | 6135-99-658-9085     | Aircraft probe  |
| G 9-124                              | 3s1p<br>G20           | 9.0 V             | 8.4 V             | 6.0 V             | 7.5 Ah             | 110 x 42 x 83 mm        | 370 g                   | 6135-14-383-9768     | Missile   |
| G 15-114                             | 5s2p<br>G06           | 15.0 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 + other applications                   |
| G 15-127                             | 2 x 5s1p<br>G62       | 2x15.0 V          | 2x14.0 V          | 2x10.0 V          | 34 or<br>68 Ah     | 216 x 152 x 92 mm       | 3500 g                  | 6135-99-794-2896     | Special forces  |
| G 18-115                             | 6s1p<br>G20           | 18.0 V            | 16.8 V            | 12.0 V            | 7.5 Ah             | 131.6 x 66.8 x 128 mm   | 850 g                   | 6135-99-795-4350     | Radiocommunication + other applications                   |
| G 30-101                             | 10s1p<br>G20          | 30.0 V            | 28.0 V            | 20.0 V            | 7.5 Ah             | 184.5 x 73.5 x 80 mm    | 1500 g                  | 6135-99-747-4430     | Radiocommunication + other applications                   |
| G 30-102/B                           | 10s1p<br>G22          | 30.0 V            | 28.0 V            | 20.0 V            | 16.0 Ah            | 184 x 72.5 x 133 mm     | 2500 g                  | 6135-99-840-0109     | Radiocommunication + other applications                   |
| Li/3                                 | 3s1p<br>LO 26 SX      | 9.0 V             | 8.4 V             | 6.0 V             | 7.5 Ah             | 110 x 42 x 81 mm        | 450 g                   | 6135-14-383-9768     | Missile launcher  |

\* Xs Yp = Y parallel branches of X cells in series per branch

\*\* SOCI: State of Charge Indicator

**Primary cells and batteries are not rechargeable.**

**This data sheet is an insert part of the Primary lithium batteries Selector Guide (ref 31048-2), where complementary information and data on features, safety and storage can be found.**

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# Primary lithium batteries

## Li-MnO<sub>2</sub> range



### Li-MnO<sub>2</sub> cells

| Production site | Size | Open circuit voltage | Nominal voltage | Nominal capacity (drain) (2.0 V cut-off) | Maximum recommended continuous current | Operating temperature range | Outside diameter max. | Height max. | Weight | UL recognition | Transport status |
|-----------------|------|----------------------|-----------------|--|--|-----------------------------|-----------------------|-------------|--------|----------------|------------------|
|-----------------|------|----------------------|-----------------|--|--|-----------------------------|-----------------------|-------------|--------|----------------|------------------|

#### LM spiral cells

|                 |          |           |       |       |                  |       |            |         |          |        |   |                |
|-----------------|----------|-----------|-------|-------|------------------|-------|------------|---------|----------|--------|---|----------------|
| <b>LM 17130</b> | USA      | 1/3 A     | 3.2 V | 3.0 V | 0.5 Ah (4.5 mA)  | 0.3 A | -40/+ 70°C | 16.7 mm | 16.6 mm  | 8.0 g  | — | Non-restricted |
| <b>LM 22150</b> | USA      | 1/3 sub-C | 3.2 V | 3.0 V | 0.9 Ah (40 mA)   | 0.4 A | -40/+ 70°C | 22.8 mm | 17.3 mm  | 15.0 g | — | Non-restricted |
| <b>LM 33550</b> | USA      | D         | 3.2 V | 3.0 V | 12 Ah (250 mA)   | 4.0 A | -40/+ 70°C | 34.2 mm | 61.4 mm  | 120 g  | — | Class 9        |
| <b>M 49</b>     | Germany* | 3/4 sub-C | 3.2 V | 3.0 V | 1.6 Ah (80 mA)   | 0.3 A | -40/+ 70°C | 22.5 mm | 32.0 mm  | 24.0 g | — | Class 9        |
| <b>M 52 HR</b>  | Germany* | C         | 3.2 V | 3.0 V | 4.8 Ah (150 mA)  | 2.0 A | -40/+ 70°C | 26.2 mm | 51.5 mm  | 59.0 g | — | Class 9        |
| <b>M 56</b>     | Germany* | 5/4 C     | 3.2 V | 3.0 V | 6.7 Ah (150 mA)  | 2.5 A | -40/+ 70°C | 26.2 mm | 61.5 mm  | 70 g   | — | Class 9        |
| <b>M 19</b>     | Germany* | "Short" D | 3.2 V | 3.0 V | 9.5 Ah (150 mA)  | 3.0 A | -40/+ 70°C | 33.5 mm | 58.5 mm  | 105 g  | — | Class 9        |
| <b>M 20</b>     | Germany* | D         | 3.2 V | 3.0 V | 12.6 Ah (150 mA) | 3.5 A | -40/+ 70°C | 34.2 mm | 61.5 mm  | 117 g  | — | Class 9        |
| <b>M 20 HR</b>  | Germany* | D         | 3.2 V | 3.0 V | 11.5 Ah (0.5 A)  | 4.0 A | -40/+ 70°C | 34.2 mm | 61.5 mm  | 117 g  | — | Class 9        |
| <b>M 24 HR</b>  | Germany* | DD        | 3.2 V | 3.0 V | 20.0 Ah (2.0 A)  | 6.0 A | -40/+ 70°C | 33.5 mm | 110.5 mm | 201 g  | — | Class 9        |
| <b>M 62</b>     | Germany* | "Big" DD  | 3.2 V | 3.0 V | 33.0 Ah (1.6 A)  | 6.0 A | -40/+ 70°C | 42.5 mm | 133 mm   | 355 g  | — | Class 9        |

\* FRIWO cell series

**Primary cells and batteries are not rechargeable.**

**Their internal impedance may rise versus time, especially in case of exposure at elevated temperature.**

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## Li-MnO<sub>2</sub> Military battery packs

| Cell type construction* | Open circuit voltage | Nominal voltage | Voltage cut-off | Nominal capacity | Maximum dimensions | Weight | NATO Stock Number (NSN) | Typical applications |
|-------------------------|----------------------|-----------------|-----------------|------------------|--------------------|--------|-------------------------|----------------------|
|-------------------------|----------------------|-----------------|-----------------|------------------|--------------------|--------|-------------------------|----------------------|

|                   |                      |             |           |           |             |                   |                 |                  |  |
|-------------------|----------------------|-------------|-----------|-----------|-------------|-------------------|-----------------|------------------|--|
| <b>BA 5368/U</b>  | 4s1p<br>LM 22150     | 12.8 V      | 12.0 V    | 9.0 V     | 0.9 Ah      | 76.2 x 26.9 mm    | 145 g           | 6135-01-455-7947 | Radiocommunication (PRC-90-103-106-195)              |
| <b>BA 5372/U</b>  | 2s1p<br>LM 17130     | 6.4 V       | 6.0 V     | 4.0 V     | 0.5 Ah      | 16.5 x 33.0 mm    | 20 g            | 6135-01-214-6441 | Radiocommunication (SINGARS)                         |
| <b>BA 5390/U</b>  | 5s1p x 2<br>LM 33550 | 16.5 V/33 V | 15 V/30 V | 10 V/20 V | 24 Ah/12 Ah | 127x111.8x62mm    | 1.41 kg/3.10 kg | 6135-01-036-3495 | Radiocommunication (AN/PBC 104/113/117/119)          |
| <b>3.M20**</b>    | 3s1p<br>M20          | 9.9 V       | 9.0 V     | 6.0 V     | 10.5 Ah     | 65 x 64 x 69 mm   | 360 g           | —                | EPIRB  |
| <b>4.M52 HR**</b> | 4s1p<br>M52 HR       | 13.2 V      | 12.0 V    | 8.0 V     | 4.5 Ah      | 40x58.5x105 mm    | 270 g           | 6135-12-322-9102 | ABC protective equipment                             |
| <b>5.M20**</b>    | 5s1p<br>M20          | 16.5 V      | 15.0 V    | 10.0 V    | 10.5 Ah     | 100 x 110 mm      | 740 g           | 6135-12-310-5164 | ABC protective equipment                             |
| <b>6.M20**</b>    | 6s1p<br>M20          | 19.8 V      | 18.0 V    | 12.0 V    | 10.5 Ah     | 124 x 64 x 69 mm  | 710 g           | 6135-12-346-1035 | EPIRB  |
| <b>6.M20**</b>    | 6s1p<br>M20          | 19.8 V      | 18.0 V    | 12.0 V    | 10.5 Ah     | 80 x 90 x 125 mm  | 950 g           | —                | Military use   |
| <b>10.M20**</b>   | 10s1p<br>M20         | 33.0 V      | 30.0 V    | 20.0 V    | 10.5 Ah     | 162 x 68 x 109 mm | 1500 g          | 6135-12-339-0295 | ABC protective equipment                             |
| <b>MIRA**</b>     | 10s1p<br>M24 HR      | 33.0 V      | 30.0 V    | 20.0 V    | 20.0 Ah     | 133 x 72 x 184 mm | 2500 g          | 6135-12-329-3740 | Thermal sight system MIRA (for missile system MILAN) |
| <b>MR 506**</b>   | 6s1p<br>M49          | 19.8 V      | 18.0 V    | 12.0 V    | 1.8 Ah      | 37 x 56 x 78 mm   | 200 g           | 6135-12-339-9599 | Emergency radio                                      |
| <b>MR 509**</b>   | 3s1p<br>M52 HR       | 9.9 V       | 9.0 V     | 6.0 V     | 4.5 Ah      | 54 x 37 x 75 mm   | 180 g           | 6135-12-353-2558 | Emergency radio                                      |
| <b>SEM 52**</b>   | 3s1p<br>M52 HR       | 9.9 V       | 9.0 V     | 6.0 V     | 4.5 Ah      | 65 x 33 x 78.5 mm | 208 g           | 6135-12-308-9723 | Radiocommunication (SEM 52)                          |
| <b>SEM 70**</b>   | 6s1p<br>M20          | 19.8 V      | 18.0 V    | 12.0 V    | 10.5 Ah     | 38 x 72 x 191 mm  | 750 g           | 6135-12-309-8604 | Radiocommunication (SEM 70)                          |
| <b>SEM91/93**</b> | 3s1p<br>M52 HR       | 9.9 V       | 9.0 V     | 6.0 V     | 4.5 Ah      | 65 x 33 x 78.5 mm | 208 g           | 6135-12-355-0737 | Radiocommunication (SEM 91/93)                       |

\* Xs Yp = Y parallel branches of X cells in series per branch

\*\* FRIWO batteries

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**Saft is committed to the highest standards of environmental stewardship.**

Implementing this commitment to minimise the impact of its products and operations on the environment means that Saft gives priority to recycled over unrecycled raw materials, reduces its plant releases into the environment year after year, minimizes water usage, and ensures that its customers have recycling solutions for their batteries at the end of their lives. Regarding industrial Ni-Cd batteries, Saft has had partnerships for many years with collection companies in most EU countries as well as in North America. This collection network receives and dispatches our customers' batteries at the end of their lives to fully approved recycling facilities, in compliance with the Laws governing transboundary waste shipments. Saft offers these services free of charge to its customers.

Please find a list of our collection points on our web site: [www.saftbatteries.com](http://www.saftbatteries.com)

In other countries, Saft assists its customers in finding environmentally sound recycling solutions. Please contact your sales representative for further information.

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