EnerSys Advanced Systems Inc. (EAS) is the leading producer of lithium primary reserve batteries in the U.S. We have provided state-of-the-art batteries to the U.S. Department of Defense (DoD) for over 48 years and have delivered over 30 million primary batteries to the DoD and allied governments.

EAS is consistently advancing the state-of-the-art in lithium reserve batteries to meet the demands of modern weapon systems.

### Description

<table>
<thead>
<tr>
<th>Device Number</th>
<th>Voltage (v)</th>
<th>Current (mA)</th>
<th>Capacity (mAh)</th>
<th>Weight (oz/gm)</th>
<th>Acceleration (G)</th>
<th>Electrochemistry</th>
<th>Activation Mechanism</th>
<th>Activation units (sec)</th>
<th>Typical Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>G3168B1</td>
<td>2.5 to 4.25</td>
<td>0.250</td>
<td>2.0</td>
<td>0.02/0.5</td>
<td>25,000</td>
<td>Li/\text{SOCl}_2</td>
<td>Stab initiated, no spin required</td>
<td>60.0</td>
<td>Sub-munitions</td>
</tr>
<tr>
<td>G3198A1</td>
<td>2.0 to 4.25</td>
<td>30</td>
<td>3.13</td>
<td>1.3</td>
<td>70,000</td>
<td>Li/\text{SO}_2\text{Cl}_2</td>
<td>Stab initiated, spin required</td>
<td>0.025</td>
<td>Medium caliber projectiles, electronic fuzing</td>
</tr>
<tr>
<td>G3165C1</td>
<td>2.5 to 4.25</td>
<td>20</td>
<td>3.4</td>
<td>0.07/2.0</td>
<td>75,000</td>
<td>Li/\text{SOCl}_2</td>
<td>Gun launch, spin required</td>
<td>0.025</td>
<td>Medium caliber projectile fuzing</td>
</tr>
<tr>
<td>G3196A1</td>
<td>2.0 to 4.0</td>
<td>1,500</td>
<td>6.5</td>
<td>0.106/3.0</td>
<td>75,000</td>
<td>Li/\text{SOCl}_2</td>
<td>Setback Initiated</td>
<td>50.0</td>
<td>Small-medium caliber munitions proximity sensors</td>
</tr>
</tbody>
</table>

For information on lithium primary reserve batteries, please contact EAS at 1-800-336-3677.
**EAS Liquid Reserve Battery Advantages:**

- Long shelf life of over 20 years prior to activation
- Optimization for operation in high acceleration environments (up to 100,000 G's) and high spin rate (30,000 RPM) applications that ordinary batteries cannot survive
- Operation across the full military temperature range (-50°F to +160°F/-45˚C to +71˚C). Extended temperature ranges available
- Flexibility to accommodate both low and high rate production

**Electrochemical Systems Offered:**

- Lithium/Thionyl Chloride (Li/SOCI2)
- Lithium/Sulfuryl Chloride (Li/SO2Cl2)
- Lithium/Sulfur Dioxide (Li/SO2)
- Lithium/Vanadium Pentoxide (Li/V2O5)
- Lithium Silicon/Iron Disulfide (LiSi/FeS2)

### Multi-cell High Voltage Liquid Reserve Batteries

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5 to 3.6</td>
<td>2.5 to 3.6</td>
<td>25 to 39.1</td>
<td>5.6 to 12.0</td>
<td>5.6 to 12.0</td>
<td>5.5 to 7.5</td>
</tr>
<tr>
<td>0.5</td>
<td>0.5</td>
<td>500</td>
<td>350</td>
<td>350</td>
<td>36</td>
</tr>
<tr>
<td>280</td>
<td>280</td>
<td>8.0</td>
<td>30</td>
<td>30</td>
<td>350</td>
</tr>
<tr>
<td>0.18/5.1</td>
<td>0.22/6.2</td>
<td>1.81/51.2</td>
<td>2.50/71.0</td>
<td>2.01/57.0</td>
<td>2.82/80.0</td>
</tr>
<tr>
<td>15,000</td>
<td>30,000</td>
<td>55,000</td>
<td>30,000</td>
<td>30,000</td>
<td>15,000</td>
</tr>
<tr>
<td>Li/SOCI2</td>
<td>Li/SOCI2</td>
<td>Li/SOCI2</td>
<td>Li/SOCI2</td>
<td>Li/SOCI2</td>
<td>Li/SOCI2</td>
</tr>
<tr>
<td>Primer or stab initiated, no spin required</td>
<td>Primer or stab initiated, no spin required</td>
<td>Gun launch, no spin required</td>
<td>Gun launch, spin required</td>
<td>Primer initiated, spin required</td>
<td>Electric primer initiated, no spin required</td>
</tr>
<tr>
<td>0.5</td>
<td>0.8</td>
<td>0.025</td>
<td>0.1</td>
<td>0.1</td>
<td>2.0</td>
</tr>
<tr>
<td>Long post-activation life</td>
<td>Artillery fuzing, High-G launch hardened</td>
<td>Tank munitions, electronic safe &amp; arm fuzing</td>
<td>Artillery fuzing, projectiles</td>
<td>Electronic fuzing, projectiles, bombs</td>
<td>Guidance, data hold functions, projectiles</td>
</tr>
</tbody>
</table>

EAS Liquid Reserve Batteries, contact us at: 215-674-3800 • aerodefense.sales@enersys.com • v
**Products Offered:**
Lithium liquid reserve batteries
Lithium thermal batteries
Lithium-ion rechargeable batteries

**EAS Comprehensive Thermal Battery Capabilities:**
- Battery design and development
- Raw material purification and characterization
- Prototyping
- Test and evaluation
- Automated manufacturing
- High volume production of thermal batteries up to 5 inches in diameter

More batteries are available; contact EAS for a full listing.

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**Thermal Batteries**

<table>
<thead>
<tr>
<th>Device Number</th>
<th>Voltage (v)</th>
<th>Current (mA)</th>
<th>Capacity (mAh)</th>
<th>Weight (oz/gm)</th>
<th>Acceleration (G)</th>
<th>Electrochemistry</th>
<th>Activation Mechanism</th>
<th>Activation units (sec)</th>
<th>Typical Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>P8100A1</td>
<td>6 to 8.5</td>
<td>11.0 to 35.0</td>
<td>22 to 32</td>
<td>20</td>
<td>&lt;0.5</td>
<td>LiSi/FeS₂</td>
<td>Setback initiated</td>
<td>&lt;0.5</td>
<td>Precision munitions, guided projectiles</td>
</tr>
<tr>
<td>P8101A1</td>
<td>741</td>
<td>1,000</td>
<td>700</td>
<td>20</td>
<td>&lt;0.5</td>
<td>LiSi/FeS₂</td>
<td>Electric Igniter</td>
<td>&lt;0.5</td>
<td>Air delivered weapons &amp; projectiles – extended temperature range</td>
</tr>
<tr>
<td></td>
<td>28.8</td>
<td>20</td>
<td>20</td>
<td>300</td>
<td>&lt;0.5</td>
<td>LiSi/FeS₂</td>
<td>Electric igniter</td>
<td>&lt;0.5</td>
<td>Smart weapons, missiles, electronic fuzing, guided and artillery projectiles</td>
</tr>
<tr>
<td></td>
<td>5.3/150</td>
<td>2.82/80</td>
<td>8.82/250.0</td>
<td>30,000</td>
<td>&lt;0.5</td>
<td>LiSi/FeS₂</td>
<td>Electric Igniter</td>
<td>&lt;0.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>30,000</td>
<td>30,000</td>
<td>30,000</td>
<td>30,000</td>
<td>&lt;0.5</td>
<td>LiSi/FeS₂</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Drawings not to scale. All measurements shown in inches.

www.enersys.com/defense/EAS
EnerSys® is a U.S. owned global corporation with its headquarters located in Reading, PA, USA. Our extensive aerospace and defense product range supplies power to a variety of military aviation, general/commercial aviation, tactical vehicles, ships, submarines, satellites, space launch, soldier-portable, renewable energy, and smart weapons applications.

Armed forces throughout the world use EnerSys batteries including lithium-ion, lithium primary reserve, VRLA and NiCd technologies.

EnerSys does more than just supply batteries; it offers integrated energy storage solutions to customers in the commercial market and to armed forces around the world. EnerSys works in close partnership with its customers to provide complete stored energy solutions.

**LITHIUM-ION RECHARGEABLE BATTERIES**

EnerSys Advanced Systems has a long heritage in the design and development of Lithium-ion batteries for space and military applications.

**EnerSys Advanced Systems Rechargeable Battery Capabilities:**

- Assembly and manufacturing of both small and large format lithium-ion rechargeable batteries
- Testing and cycling
- Automation used for key operations
- Proprietary Battery Management System Technology

![Lithium-ion Production Area](image_url)
EnerSys Advanced Systems (EAS) has a skilled workforce and the facilities required to design, develop, manufacture, test, and analyze lithium batteries.

In addition to serving military markets, EAS designs and produces batteries for a wide variety of applications, including space, specialized industrial, and commercial uses.

EAS is your full-service solution supplier. Whether it is a custom battery or a configuration requiring high-volume automated production, EAS can provide the lithium power source that meets your needs.

EAS located in Horsham, PA features:
- A 52,000 sq. ft. state-of-the-art facility
- 40,000 sq. ft. of manufacturing space
- 9,000 sq. ft. of dry-room space
- Extensive laser welding capability
- An in-house machining and tool room
- Short production runs and prototyping
- Multiple production lines for maximum flexibility
- Automated battery assembly equipment
- Extensive battery testing equipment and expertise
- ISO 9001 certified
- U.S. owned company/U.S. manufactured batteries

EAS Battery Products

These batteries and associated technical data are subject to the regulations of the International Traffic in Arms Regulations (ITAR) contained in 22 C.F.R. Parts 120-130. Any export or re-export of these products require a prior written export authorization from the U.S. Department of State. It is the responsibility of the purchasing or receiving party to comply with all requirements of the ITAR, including ensuring that all required export authorizations are in place prior to exportation or re-exportation.

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