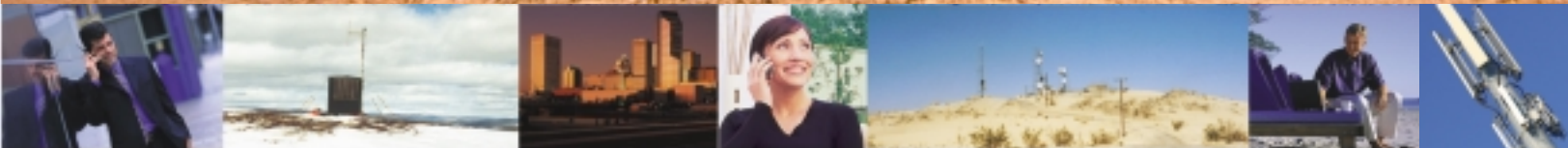


Battery systems for telecom networks

Power solutions for multiple needs



Saft battery systems

As telecom markets expand –

Efficient and reliable back-up is essential to deliver a high Quality of Service in telecom networks. Saft has solutions today and, as the market evolves, is developing cutting-edge systems with exceptional capability for the future.



Specific challenges...

Energy systems for fixed wireless, cable and cellular networks are essential to

- ensure high level of Quality of Service
- withstand extreme temperatures and punishing humidity
- operate with total reliability, often in remote locations

...particular requirements...

For these applications a back-up battery system should offer

- high reliability and availability
- ability to operate at high temperatures with little effect on operating life
- more Energy / Power availability in constrained space
- good electrical and mechanical abuse resistance
- high charge efficiency
- good cycling capability
- minimal maintenance
- low weight and volume if transported to remote places
- favourable life cycle cost

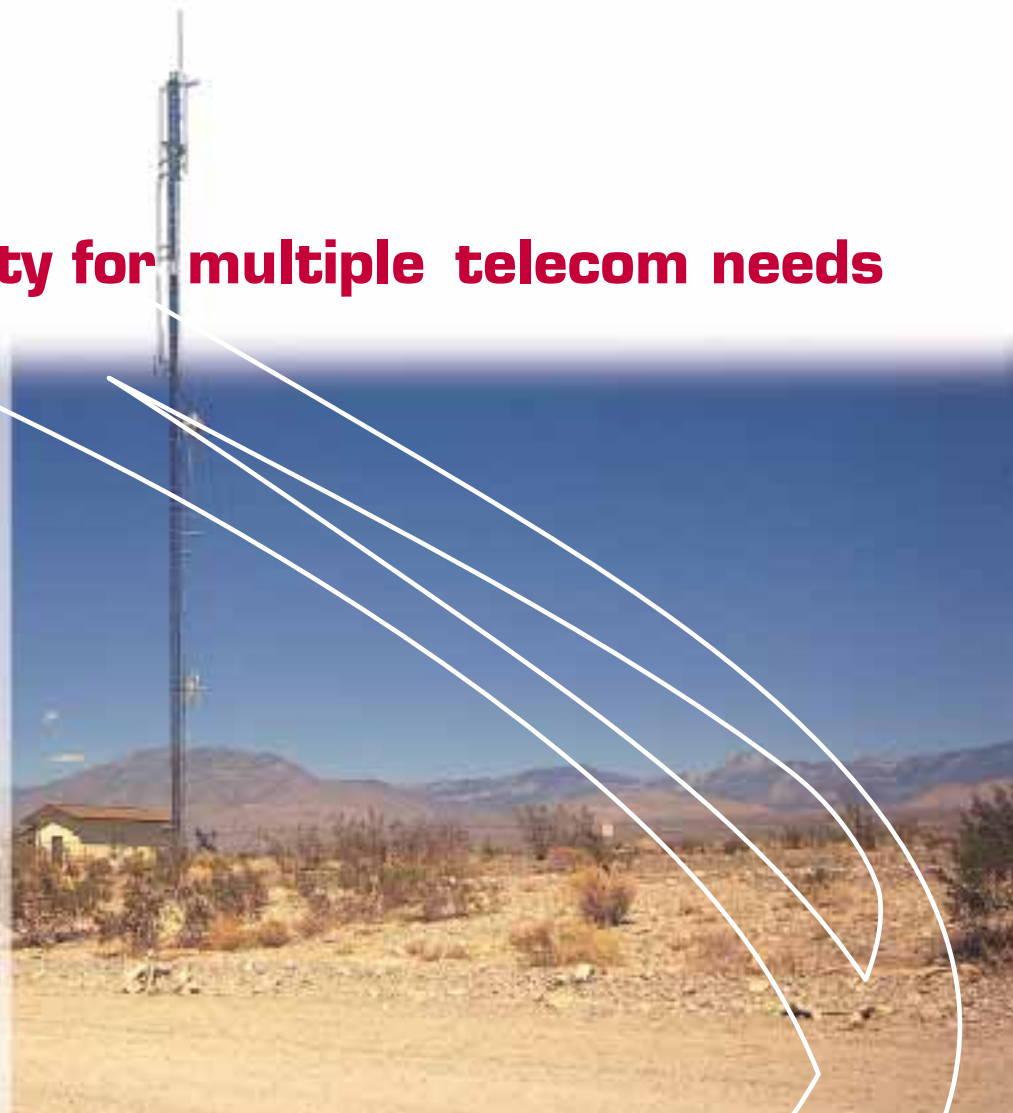


- a broad capability for multiple telecom needs

As the demands of telecom networks intensify, Saft's portfolio of advanced battery technologies is matching this rapid evolution by providing a wide range of back-up power choices for multiple infrastructure applications.

Saft is already supporting some of the world's major operators.

- Ni-Cd is mature and well-proven – offering total reliability and low maintenance at a low life cycle cost
- Ni-MH sealed alkaline batteries are maintenance-free and demonstrate exceptional capability in harsh conditions on remote sites
- Li-ion battery systems are fully integrated, innovative and intelligent, providing flexible solutions for complex demands in the future



...total solutions

Saft battery systems are optimized for specific telecom applications:

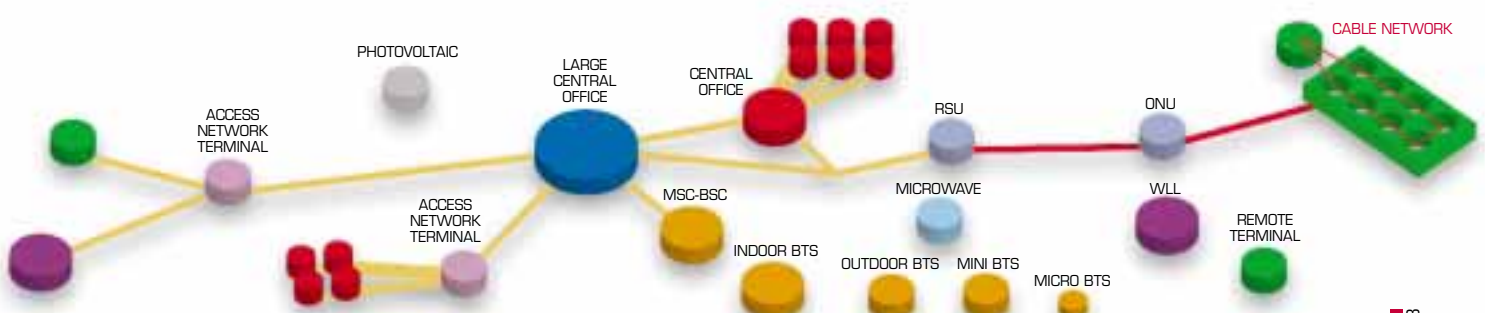
- XDSL access
- POTS access units
- PSTN local exchange
- mobile network technologies
- wireless local loop
- cable TV
- micro- and macro-BTS
- base station controllers
- optical node units
- central offices

Moving with the market

Saft's global presence and proven telecoms expertise add up to the broad capability essential to meet today's rapidly evolving telecom needs. For the future, Saft offer pro-active market integration and technical excellence to break new ground in:

- reliability
- energy and power density performance
- reduced battery life cycle cost
- subsidiary components such as electronic cards
- reduced volume and weight

Saft's programme includes researching, developing and implementing the next generation of technologies, such as Intensium. Offering 140 Wh/L for a fully integrated system, Intensium 3 already provides impressive high energy performance. Saft has established a roadmap to increase energy density of telecom Li-ion battery systems to 200 Wh/L.



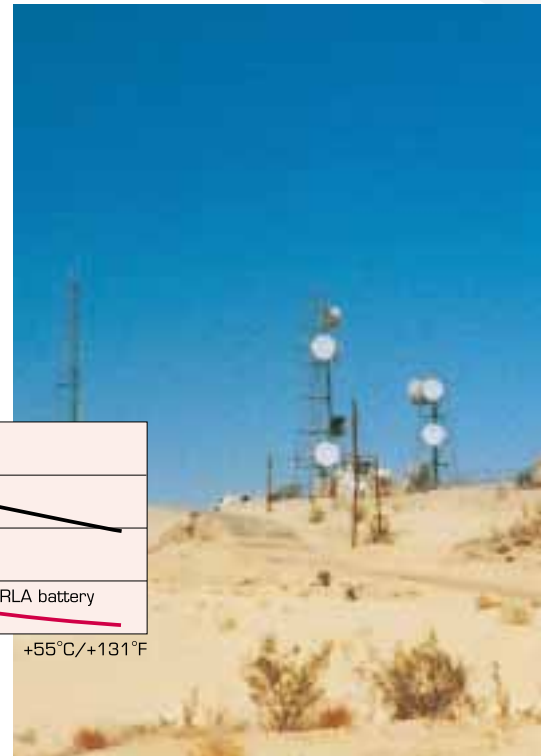
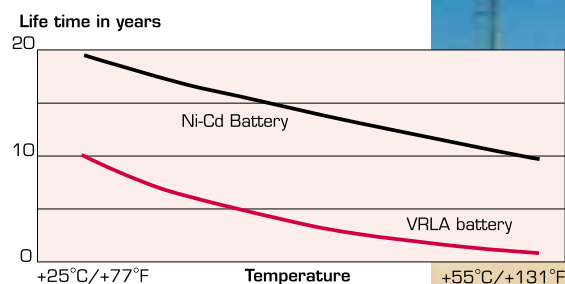
Saft Ni-Cd

Assuring telecom infrastructures worldwide

Saft's mature, proven, alkaline Ni-Cd technology is already mass-deployed in batteries for telecom networks, demonstrating exceptional reliability, even at high temperatures. Ni-Cd has an impressive track record guarding telecom access and cellular networks, ensuring a high Quality of Service.

Ni-Cd continues faithfully to operate in unpredictable environmental patterns, in remote locations and harsh conditions. Limitations of conventional lead acid batteries – inefficiency and high operating costs in extreme temperatures, risk of sudden death, regular maintenance and replacement – make them less suitable and less able to meet new demands of an evolving market. Saft's pocket plate and sintered/pbe technologies:

- are intrinsically reliable
- require very low maintenance
- tolerate wide temperature fluctuations
- resist physical and electrical abuse
- cannot corrode
- demonstrate excellent cycling capability
- are modular, ideal in retrofit



Batteries with reliability built in

Ultima.plus

Ultima.plus endows robust pocket plate technology with special features that minimise water use to give extended life, ultra-low maintenance and total reliability.

This battery is an excellent choice for safer, longer-lasting power back-up in, for example, telecom central offices, microwave repeaters, point-to-point and point-to-multiple-point terminals, offering:

- easy installation
- excellent robustness
- long life in extreme temperatures
- very low life cycle cost



Sunica.plus

Solar power is the solution of choice for off-grid telecom sites demanding high system reliability with low maintenance and reduced running costs.

Sunica.plus is built robustly with special features specifically to satisfy the demands of photovoltaic and wind energy electrical storage applications. This design is tailored for deployment in outdoor telecom installations sited in harsh environments and suffering widely fluctuating temperatures between extremes of -50°C to 70°C (-58°F to +158°F). Sunica.plus will provide:

- high cycling capability
- a resistance to erratic charging conditions
- use in temperature fluctuations
- absolute reliability with low maintenance



NCX

The combination of sintered/pbe, flooded electrolyte and corrosion-free technology gives NCX the edge over conventional VRLA, particularly in extreme conditions. NCX is resilient and compact, allowing hundreds of Ah per valuable square metre in outdoor cabinets, huts, shelters, CEVs, indoor racks and central offices – a solution for the particular constraints of roof-top installations. NCX offers:

- direct retrofit with VRLA
- field-proven reliability
- long life in extreme temperatures
- very low maintenance with Water Filling System





Saft Ni-MH

The zero maintenance option

Saft Ni-MH is state-of-the-art sealed alkaline technology which precisely answers requirements for enhanced energy density, maintenance-free operation and excellent duration life.

Ni-MH is simple to handle, easy to fit and quickly operational, providing instant, totally reliable service – useful benefits in remote locations with difficult access.

Ni-MH block batteries featuring 140 Wh/L offer reliable and compact energy storage for Central Offices.



140 Wh/L



30 Ah for SLC

SPH

Guaranteed uninterrupted power is essential for telecom infrastructures and Saft SPH provides instant power to start back up diesel engine generators in the event of mains failure.

For central office deployment, SPH sintered/pbe and recombination technology reduce water loss and, with alkaline electrolyte, does not produce fumes. SPH has been proven in industry over many years to deliver:

- high discharge capability
- long life in extreme temperatures
- direct retrofit with VRLA
- absolute reliability with low maintenance



The small nickel-metal hydride battery now makes retrofit of VRLA in distributed power cabinets fast and very simple. Saft's Ni-MH brings additional benefits of:

- direct retrofit for VRLA
- extended life at high temperature
- zero maintenance
- integrated charger/controller

With this technology, Saft is able to offer enhanced specific energy end energy density leading to longer life and more efficient operation.



Li-ion: technology with the edge for telecoms of the future

Li-ion battery systems offer outstanding performance and are the most promising solution for both energy storage and high power telecom applications of the future. Li-ion offers:

- extended lifetime, even at high temperatures
- very high energy efficiency
- sealed, maintenance-free reliability
- unbeatable capability in shallow and deep cycling
- intelligent system state of charge and state of health remote monitoring



Intensium: the next generation Power and Energy ranges

Saft's Intensium 48 V battery systems bring to telecoms applications the exceptional power and energy density of lithium-ion technology. Power and high Energy battery systems combine

- long life
- hot-pluggable simplicity
- zero maintenance
- unsurpassed compactness
- remote monitoring

into reduced volume, rack-mount ETSI format units designed specifically for telecom outdoor BTS, BSC, RT, ONU and HFC applications.

Intensium 1

Intensium 1 is designed to back up micro-BTS and represents a breakthrough in battery design for telecom infrastructure applications. Featuring reduced volume, top reliability and ease of operation in an exceptionally efficient 1U format, more cabinet space remains for essential value-generating equipment.

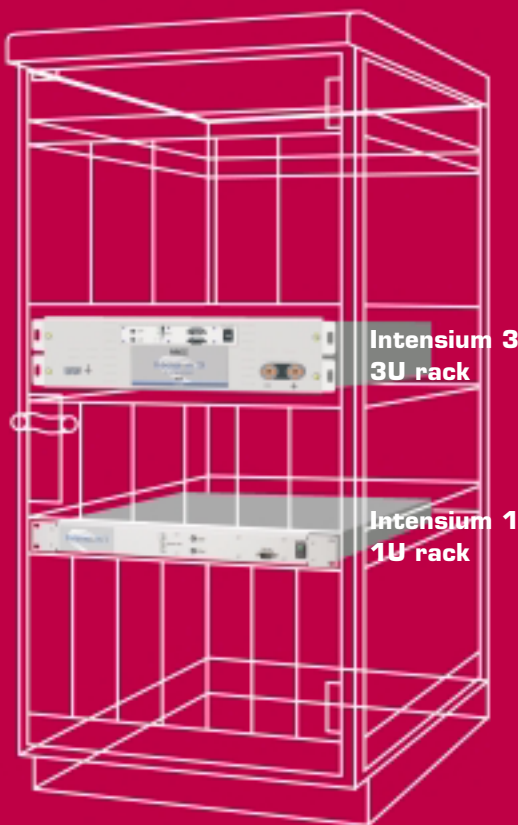
- integrated 48 V system ensuring up to 3 kW in 1U
- 75% less volume and weight than conventional batteries for these duties
- parallel operation, for scalability up to 12 kW

Intensium 3

Saft's Intensium 3 is highly advanced technology, building battery function and monitoring features into a stand-alone, 3U format, integrated energy storage system. Maintenance-free, with outstanding durability, and internal resistance stability, Intensium 3 Energy 2000 performs even in the most difficult environmental conditions.

- integrated 48 V system containing 2.2 kWh of energy
- parallel operation for scalability up to 18 kWh
- compatible with standard telecom rectifiers

Currently, Intensium offers an impressive energy density of 136 Wh/L, but its potential is significant: by optimising the battery architecture, energy and power profiles for given applications, Saft will be able to achieve an energy density of 200 Wh/L.



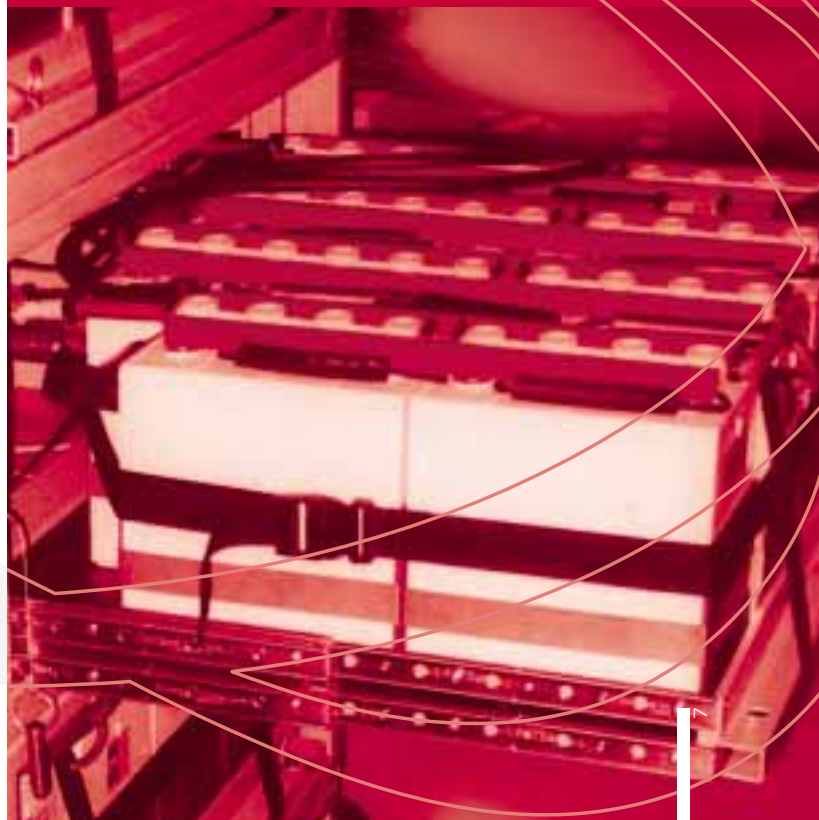
Saft

Proven expertise for evolving demands

Saft – the future for telecom infrastructures

Saft technologies are developed and qualified to suit the demanding requirements of performance and operational reliability of our customers, who are manufacturing or operating high-value, industrial equipment.

Saft's battery solutions combine technological know-how and market experience to provide dedicated systems, optimised for telecom network demands. As this market evolves, telecom infrastructures will be served by Saft system technology and supported by our on-going commitment to provide worldwide service and technical excellence.



World Class quality and environmental standards

The close synergy that is one of Saft's core values also allows us to achieve the highest quality standards in the industry, as well as full environmental safeguards and product stewardship. Saft manages every stage of the battery life cycle – from design and production to recovery and recycling. We have a take back commitment for our batteries at their end-of-life, and Saft is the only high-tech battery company with an in-house recycling unit.

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