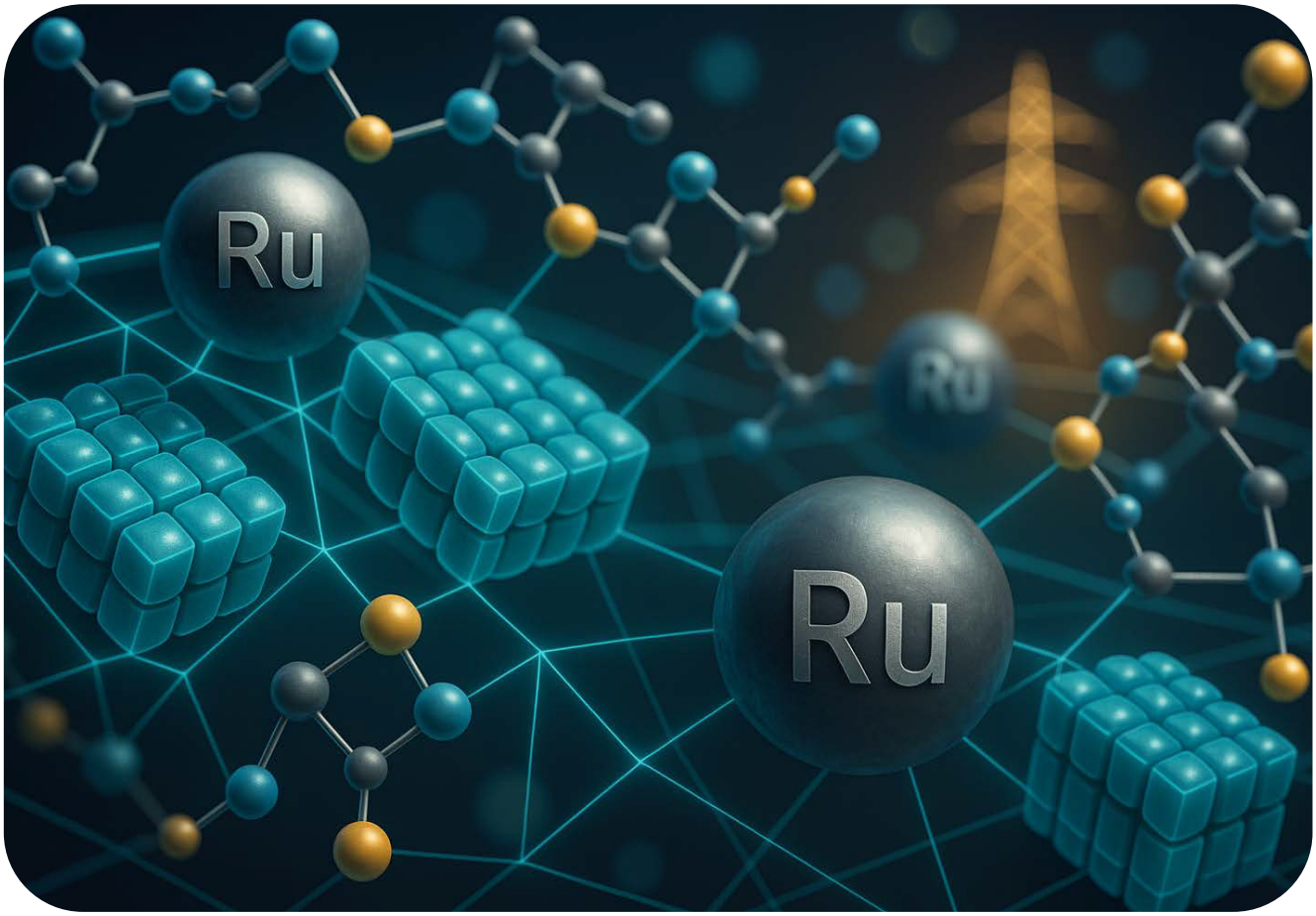
BLOOH SOLUTION LTD.

BS – RUTHENIUM-BASED

ULTRACAPACITORS

HIGH-PERFORMANCE ENERGY SYSTEMS FOR RENEWABLE STORAGE AND GRID STABILIZATION

www.blooh-solution.com



RUTHENIUM: A STRATEGIC ELEMENT FOR ENERGY SYSTEMS

Ruthenium, a member of the platinum group metals, has emerged as a key material for electrochemical energy storage. Initially explored alongside lithium in battery research, ruthenium now stands out for its exceptional pseudocapacitive behavior.

At BS, we recognized early on the transformative potential of ruthenium to make energy systems faster, more durable, and more efficient. Its integration also supports the decarbonization of transportation and decentralized power grids. Through strategic partnerships and in-house research, we continue to push the boundaries of energy storage.

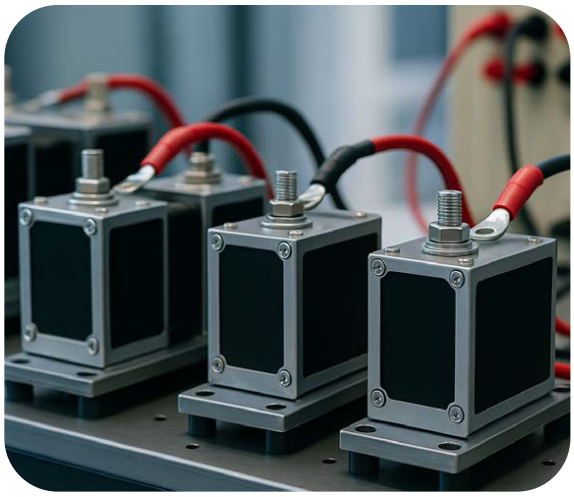
By incorporating ruthenium-based compounds into ultracapacitors, we address critical challenges in electromobility, grid regulation, and fast-charging infrastructure.

BS BREAKTHROUGH IN ULTRACAPACITOR TECHNOLOGY

BS's ultracapacitor technology is based on hydrated ruthenium oxide (RuO_2) embedded in a highly porous carbon matrix. This combination delivers exceptional power density, cycle stability, and ultra-fast charging capability.

Our technology ensures instantaneous response under extreme thermal and electrical conditions. BS capacitors feature a self-balancing architecture and an extremely low ESR (Equivalent Series Resistance), enhancing both safety and performance.

Over 1,000,000 charge/discharge cycles – ten times more than conventional lithium-ion systems.



SPEED MEETS ENDURANCE

FOR THE MOST DEMANDING ENERGY SYSTEMS

These systems operate reliably under extreme temperatures and are maintenance-free. Used in electric vehicles, wind turbines, and UPS systems, they enable rapid energy recovery, peak load compensation, and fault tolerance in both industrial and mobility applications. Their ability to respond within milliseconds makes them ideal for high-demand environments where speed, safety, and energy efficiency are critical.

BS TECHNOLOGICAL HIGHLIGHTS

- Integration of electrochemical simulations for lifetime prediction
- Plasma-sprayed electrodes with highly controlled pore structure
- In-house testing from −40°C to +100°C for extreme environments
- Multi-capacitive architecture for real-time grid segmentation

Ruthenium-based capacitors can be fully charged in less than 10 seconds—ideal for peak load management and kinetic energy recovery systems.

PORTFOLIO

MODEL RU-CAP 800

A rugged ultracapacitor for general industrial applications, built for high-load demands and reliable peak performance.

Material: Hydrated ruthenium oxide (RuO_2) on activated carbon

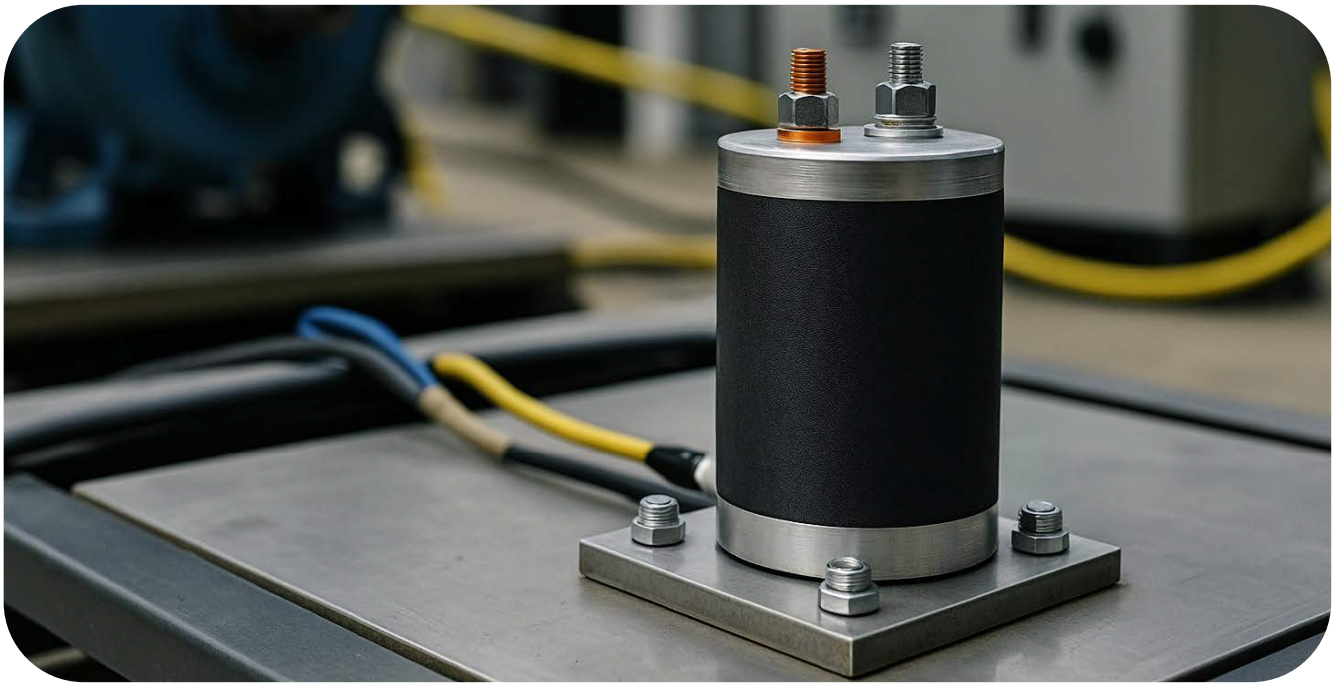
Capacitance: >800 F/g

Rated Voltage: 2.7 V (per cell)

Operating Temperature: –40°C to +85°C

Cycle Life: >1,000,000 charge/discharge cycles

Form Factor: Cylindrical, 60 mm diameter



APPLICATION AREAS

Energy recovery systems in electric vehicles

Grid stabilization in wind and solar power

High-frequency backup power in industrial settings

BENEFITS

Ultra-fast charge and discharge times

High power density with low internal resistance

Maintenance-free with long operational life

PORTFOLIO

MODEL RU-CAP FLEX

An ultra-lightweight, flexible ultracapacitor designed for tight installation spaces and portable electronics with compact energy demands.

Material: Flexible carbon substrate with RuO_2 nanocoating

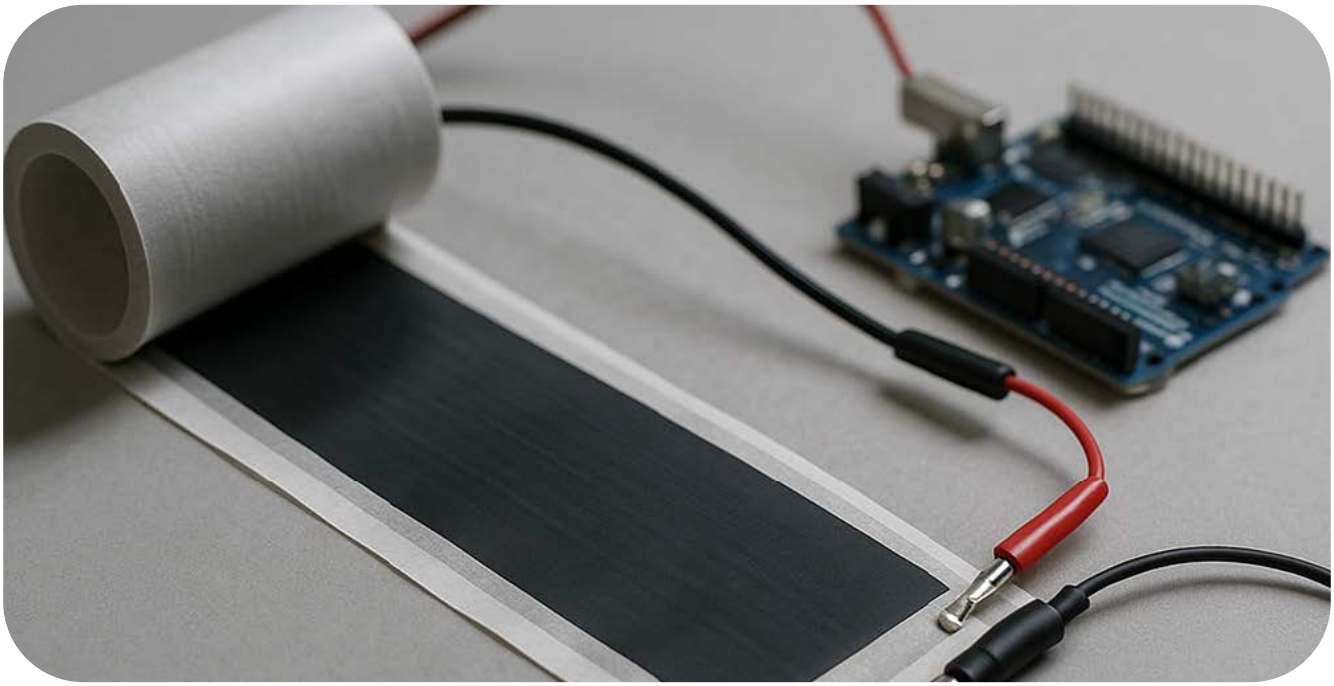
Capacitance: 550 F/g

Rated Voltage: 2.3 V

Operating Temperature: –20°C to +70°C

Cycle Life: 750,000 cycles

Form Factor: Thin-film, roll-to-roll format



APPLICATION AREAS

- Wearables and smart sensors
- Compact energy storage modules
- Aerospace applications with weight constraints

BENEFITS

- Flexible and lightweight design
- Ideal for microelectronics and compact installations
- Stable electrochemical performance under dynamic load conditions

PORTFOLIO

MODEL RU-CAP GRIDMAX

A modular high-performance storage system for grid load management, infrastructure buffering, and sustainable large-scale applications.

Material: High-surface-area RuO_2 composite on porous graphite

Capacitance: 1,200 F/g

Rated Voltage: 2.5 V

Operating Temperature: –30°C to +65°C

Cycle Life: >1.2 million cycles

Form Factor: Modular panel system

APPLICATION AREAS

Buffering in public power grids

Peak load management in microgrids

Infrastructure for public transportation

BENEFITS

Scalable installation for commercial grid systems

Optimized for high-frequency load fluctuations

Low heat generation through integrated protection mechanisms

DRIVING INNOVATION FORWARD!

FOR MORE INFORMATION PLEASE CONTACT:

BLOOH Solution Ltd.
1055 Dunsmuir St
Vancouver, BC V7X 1L4

Tel: +1 604 260 6692