BLOOH SOLUTION LTD.

BS – RUTHENIUM-BASED

THERMAL PROTECTIVE COATINGS

RELIABLE HIGH-TEMPERATURE PROTECTION FOR MODERN ENERGY AND AEROSPACE SYSTEMS

www.blooh-solution.com

RUTHENIUM: ADVANCED PROTECTION UNDER EXTREME CONDITIONS

Ruthenium is renowned for its exceptional chemical and thermal stability, revolutionizing high-temperature protection in technical applications. Initially explored in semiconductor technology, it demonstrates outstanding resistance under oxidative stress and forms stable oxides—ideal characteristics for protective coatings in modern battery systems, aerospace structures, and power electronics.

At BS, we purposefully integrate ruthenium into thermal barrier systems that go beyond conventional coating solutions. Our formulations enhance fire resistance, thermal insulation, and system durability—delivering greater safety and performance in critical applications such as EV battery housings, turbine enclosures, and hypersonic components.

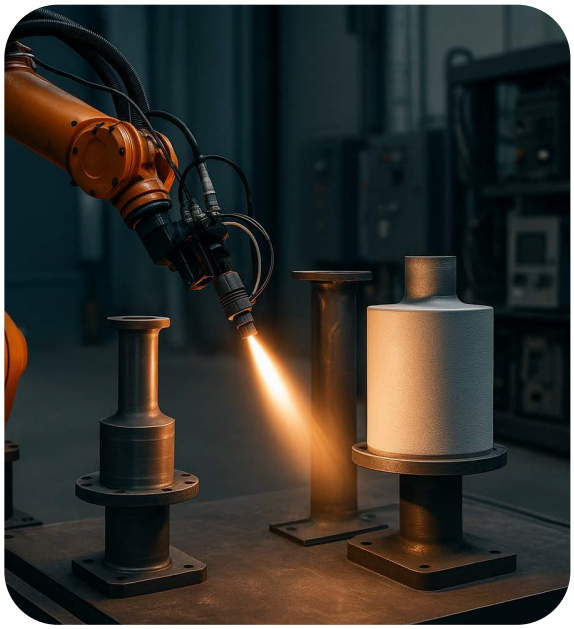
BS harnesses the chemistry of rare elements to provide functional coatings designed to meet the demands of tomorrow.

BS COATING INNOVATION

BS's ruthenium-based coatings are developed using advanced ceramic techniques and thermal spray technology. Through precise process control and selective material combinations, we produce coating systems suitable for both extreme industrial and mobile applications. Our solutions meet the highest standards for adhesion, durability, and energy efficiency.

These composite coatings combine stabilized ruthenium-zirconium oxide with nano-alumina, delivering outstanding adhesion and ultra-low thermal conductivity. The materials are meticulously tuned for their thermomechanical properties to ensure maximum safety and extended lifespan—even under cyclic thermal loads. Additionally, we apply precise microstructure control to prevent cracking caused by thermal expansion.

Thermal Conductivity <1.2 W/m·K for optimal insulation under stress



HIGH-PERFORMANCE COATINGS

ENGINEERED FOR THE FUTURE

BS thermal coatings are already in use in next-generation battery modules, aerospace systems, and high-efficiency industrial facilities. Our goal: extend system lifespan while minimizing thermal risk and material degradation.

TECHNOLOGICAL HIGHLIGHTS FROM BS:

- Multi-layer architecture for stress relief and insulation efficiency
- Plasma-assisted spray technologies for structural adhesion
- Verified performance under acid fog and salt spray exposure
- Customized coating thicknesses for EVs, aerospace, and power grids

Ruthenium coatings retain structural integrity at temperatures above 1,200°C and offer strong resistance to thermal cycling and corrosive environments.

PORTFOLIO

MODEL RU-TBC 1200

A high-performance high-temperature coating designed for e-mobility and aerospace applications requiring fire protection and structural stability.

Composition: Ruthenium-stabilized zirconium oxide + nano-alumina

Thermal Conductivity: <1.2 W/m·K

Adhesion Strength: >25 MPa

Operating Temperature: Up to 1,200°C

Application Method: Plasma spray process

Corrosion Resistance: Highly resistant to salts, acids, and alkalis

APPLICATION AREAS

Thermal insulation of EV battery modules

Thermal barriers for aerospace structures

High-temperature insulation in industrial energy systems

BENEFITS

Prevents thermal runaway in battery systems

Exceptional resistance to oxidation, corrosion, and thermal cycling

Extends component lifespan under extreme conditions

PORTFOLIO

MODEL RU-TBC FLEX

A flexible thin-film coating solution for weight-optimized applications in aerospace and power electronics, offering reliable thermal protection without compromising structural flexibility.

Composition: Ruthenium oxide on a ceramic-polymer hybrid substrate

Thermal Conductivity: ~1.5 W/m·K

Adhesion Strength: 15–20 MPa

Operating Temperature: –50°C to +950°C

Form Factor: Flexible film / roll-to-roll application

APPLICATION AREAS

- Aircraft exteriors and satellite components
- Flexible insulation in EV electronics
- Thermal shielding in wearable technologies

BENEFITS

- Lightweight and adaptable design
- Stable performance under dynamic temperature fluctuations
- Suitable for curved or movable systems

PORTFOLIO

MODEL RU-TBC GRIDSHIELD

An industrial coating system for grid storage units, battery containers, and large-scale power electronics, providing robust thermal protection, corrosion resistance, and durability in harsh environmental conditions.

Composition: Ruthenium-ceramic composite + thermal buffer layer

Thermal Conductivity: ~1.0 W/m·K

Adhesion Strength: >30 MPa

Operating Temperature: –40°C to +1,100°C

Layer Structure: Dual-phase protective architecture

APPLICATION AREAS

Outdoor protection of battery containers

Thermal management of inverters

Enclosures for grid-scale energy storage systems

BENEFITS

High integrity under UV and weather exposure

Long-term durability against temperature cycling

Customizable to system geometries and material combinations

DRIVING INNOVATION FORWARD!

FOR MORE INFORMATION PLEASE CONTACT:

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

Tel: +1 604 260 6692