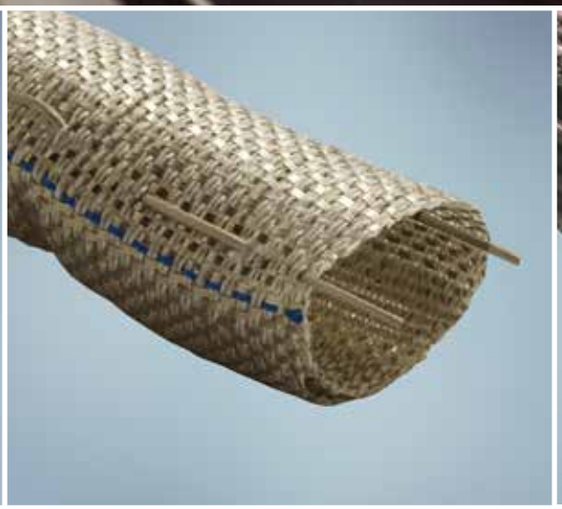
SYSTEMS™
PROTECTION

Railway Protection Products

Product Catalog



BentleyHarris®
Protection Products

About Systems Protection

Systems Protection (SP) is the world's foremost supplier of protective sleeving and shielding solutions for wires, hoses and mechanical assemblies focused on serving automotive, aerospace, rail and other transportation-based industries.

With a dynamic team of around 2000 dedicated professionals, we're more than just a company - we're a family. Each member brings their unique talents and expertise to the table, driving our success and fueling our growth.

But our impact doesn't stop there. Spanning across 13 countries, our reach extends far and wide, connecting with diverse communities and cultures around the globe.

Systems Protection leads the industry with innovative products and is recognized by our customers as the first to identify the problem and more importantly the solution. Systems Protection maintains a strong patent portfolio an important part of the history and future of the business.

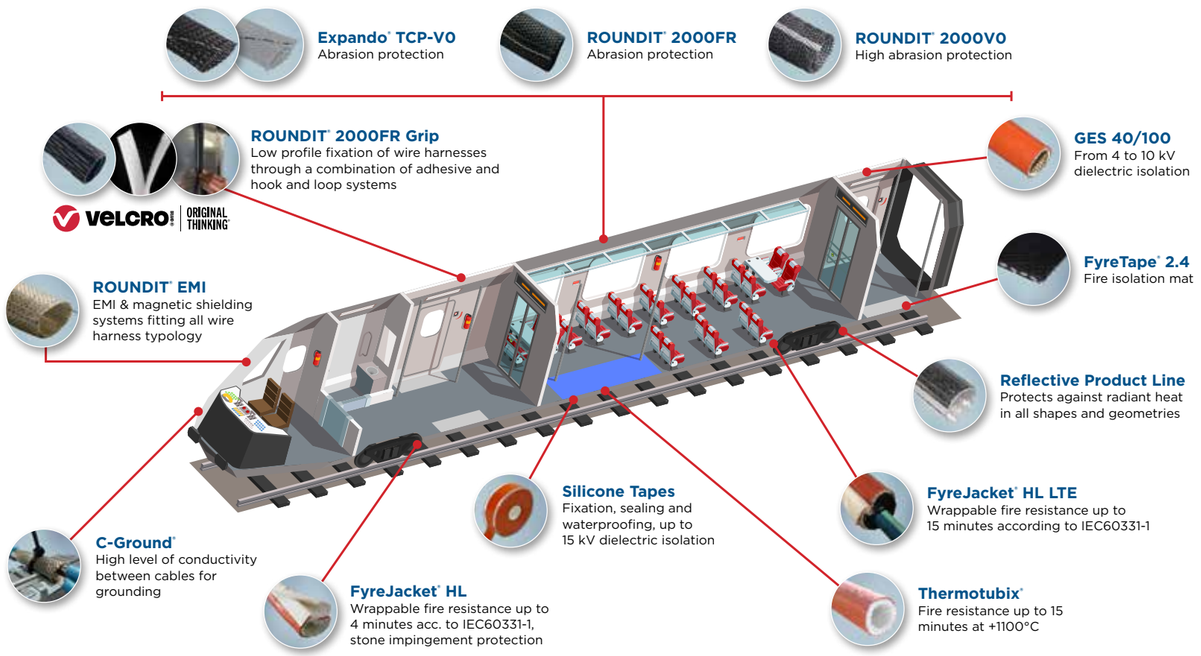
1924 — BentleyHarris® Protection Products

1998 — FEDERAL MOGUL Systems Protection

2018 — TENNECO SYSTEMS PROTECTION

2024 — SYSTEMS™ PROTECTION

End-to-End Functional Solutions



Functional solutions designed to extend component life and reduce costs.

ABRASION · IMPACT · THERMAL · HEAT · EMI · ACOUSTIC · ELECTRICAL · BUNDLING

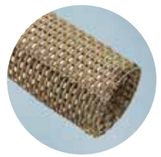
Focus on Railway Protection Management

Systems Protection is the world's foremost supplier of railway protective sleeving and shielding solutions for wires, hoses, and mechanical assemblies. As the proud designer and manufacturer of Bentley-Harris products, we offer a comprehensive line of high-quality solutions intended to protect or improve system performance across a broad range of applications.

Our full line of products designed for the railway industry have been extensively tested to the various regional requirements of our railway customers, and can be used to protect wire harnesses and cable assemblies in several areas of a railway car including in cabin, in chassis, under carriage, and within electrical cabinets. Applications include high speed trains, monorails, rolling stock, and light rail.

Visit our website to learn more.

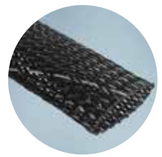
Meeting the Component Protection Needs of the Railway



Traction Control Systems

Lightweight EMI solution

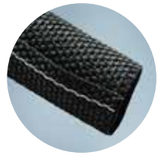
- Stable construction guarantees consistent EMI performance regardless of diameter
- Absorbs emissions from power cables
- 65% optical coverage
- Good fluid and corrosion resistance



Train Monitor Systems

Tubular abrasion protection

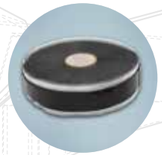
- Expandable construction fits a range of diameters for reduced inventory
- Optimized solution for long lengths without branches
- Low wall thickness easily fits inside packed raceways
- UL 94 V0 raw material



Door Systems

Flame retardant wire harness protection

- Wrappable design enables protection of breakout areas
- Passes all major regional railway flammability requirements
- Flexibility ideal for confined spaces
- Protect against metal parts during vibration



Repair of Cables

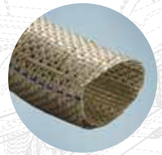
Bundling and mechanical protection

- Self-amalgamating
- UL94V0 flammability rated
- Good fluid resistance
- Easy to install
- Operating temperature up to +200°C

Bogies

Fire protection of sensitive hoses

- Provides barrier against sparks, flame, and molten metal splash
- Thick wall silicone coated knitted fiberglass sleeve for thermal insulation
- Protection against abrasion and stone impingement
- Operating temperature up to +260°C



Speed Control Systems

All inclusive EMI solution

- Integrated drain wires for easy grounding without accessories
- Eliminates the need for metallic ring, bonding lead, and crimping tool
- Tracers for indication of bundle size range
- Cu/Ni construction is both salt mist resistant

Abrasion / Mechanical Protection

Product	Description	Temperature Rating*	Flammability	Halogen Free	Design & Construction	Available Sizes
 **Expando® TCP-V0**	Expandable braid (1:2) with strong mechanical protection; with low toxicity and smoke emission.	-50°C to +150°C (-58°F to +302°F)	EN45545-2: R22: HL3 R23: HL3 NFPA 130: ASTM E-162 and ASTM E-662	✓	**Design:** Tubular **Material:** UL 94 V0 Polyester **Colors:** Black with gray tracer; Gray with a black tracer	3 to 50 mm (3/16" to 2")
 **ROUNDIT® 2000 FR**	Self-wrapping sleeve with good mechanical protection; soft to the cable structure.	-50°C to +150°C (-58°F to +302°F)	EN45545-2: R22: HL3 R23: HL3 NFPA 130: ASTM E-162 and ASTM E-662	✓	**Design:** Wrappable **Material:** Flame-retardant polyester **Color:** Black	5 to 50 mm (3/16" to 2")
 **ROUNDIT® 2000 FR GRIP**	Abrasion protection with self-locating above textile hook surface.	-55°C to +85°C (-67°F to +185°F)	EN45545-2: R22: HL3 R23: HL3	✓	**Design:** Wrappable **Material:** Flame-retardant polyester monofilaments and multifilaments **Color:** Black	3 to 38 mm (3/16" to 1-1/2")
 **ROUNDIT® 2000 V0**	Self-wrapping sleeve with high mechanical protection; ideal flame resistance with low toxicity and smoke emission	-50°C to +150°C (-58°F to +302°F)	EN 45545-2: R22: HL3 R23: HL3 NFPA 130: ASTM E-662 and ASTM E-162	✓	**Design:** Wrappable **Material:** UL 94 V0 Polyester **Color:** Black	5 to 50 mm (3/16" to 2")

Fire, Thermal & Electrical Isolation

Product	Description	Temperature Rating*	Flammability	Halogen Free	Design & Construction	Available Sizes
 **FyreJacket®**	Protects components in extreme temperatures. Silicone rubber coating has excellent shedding properties. Meets AS1072.	-54°C to +260°C (-65°F to +500°F)	IEC 60331-1: 4 minutes	✓	**Design:** Tubular **Material:** Fiberglass and silicone **Color:** Orange, black, silver	5 to 100 mm (1/4" to 4")
 **FyreJacket® HL** **FyreJacket® HL LTE**	Wrappable fire protection utilizing a specialty hook and loop closure	-60°C to +125°C (-76°F to +257°F)	EN45545-2: R22: HL3 R23: HL3 IEC 60331-1: 4 minutes (Fyrejacket HL) 15 minutes (Fyrejacket HL LTE)	✓	**Design:** Wrappable **Material:** Fiberglass and silicone **Color:** Reddish-brown	5 to 50 mm (3/16" to 2")
 **FyreTape®**	Silicone-coated tape with good fire protection; easy to install on big pipes; may be used to replace or compliment FyreJacket®	-54°C to +260°C (-65°F to +500°F)	FMVSS 302 D45 1333	✓	**Design: Flat** Wrappable **Material:** Fiberglass and silicone **Color:** Reddish- brown, aluminum	25 to 152 mm (1" to 6")
 **GES**	Coated braided sleeve with dielectric resistance to 4kV or 10kV provides effective grounding of metal braid; resistant to salt and other harsh environments	-60°C to +220°C (-76°F to +428°F)	EN45545-2: R22: HL3 R23: HL3	✓	**Design:** Tubular **Material:** Silicone rubber and fiberglass **Color:** Orange, black	0.5 to 32 mm (1/32" to 1-1/4")
 **Silicone Tape 77FR**	Provide good fluid resistance and are ideal for sealing, connectingand finishing cut ends. Also available with fiberglassreinforcement for increased mechanical strength.	-51°C to +200°C (-65°F to +400°F)	EN45545-2: R22: HL2 R23: HL2	✓	**Design:** Flat **Material:** Silicone (unsupported) or silicone with fiberglass (supported) **Color:** Black, red, and black with a blue tracer	Max. elongation ranges from 300% to 500%. Multiple widths and thicknesses available.
 **ThermoJacket® S**	High temperature fiberglass braid impregnated with an anti-fray treatment for ease of handling and installation; ideal for use in certain railway applications based on its resistance to flammability, smoke density, and toxicity	-50°C to +240°C (-58°F to +464°F)	EN45545-2: R22: HL3 R23: HL3	✓	**Design:** Tubular **Material:** Fiberglass **Color:** Natural	6 to 102 mm (1/4" to 4")

** Temperature ratings may vary due to alternate OEM test requirements*

Radiant Heat Protection

Product	Description	Temperature Rating*	Flammability	Halogen Free	Design & Construction	Available Sizes
 **Therm-L-Gard® B and B HT**	An engineered solution designed to protect sensors and connectors in radiant heat environments.	Up to +150°C or +200°C (Up to +302°F or +392°F)	Custom testing available upon request	✓	**Design:** Application specidfic **Material:** Fiberglass, aluminum and polyester or PPS monofilaments **Color:** Aluminum and black	Customized to application

Electrical Insulation

Product	Description	Temperature Rating*	Flammability	Halogen Free	Design & Construction	Available Sizes
 **GES**	Coated braided sleeve with dielectric resistance to 4kV or 10kV provides effective grounding of metal braid; resistant to salt and other harsh environments	-60°C to +220°C (-76°F to +428°F)	EN45545-2: R22: HL3 R23: HL3	✓	**Design:** Tubular **Material:** Silicone rubber and fiberglass **Color:** Orange, black	0.5 to 32 mm (1/32" to 1-1/4")
 **Silicone Tape 77FR**	Provide good fluid resistance and are ideal for sealing, connecting and finishing cut ends. Also available with fiberglass-reinforcement for increased mechanical strength.	-51°C to +200°C (-65°F to +400°F)	EN45545-2: R22: HL2 R23: HL2	✓	**Design:** Flat **Material:** Silicone (unsupported) or silicone with fiberglass (supported) **Color:** Black, red, and black with a blue tracer	Max. elongation ranges from 300% to 500%. Multiple widths and thicknesses available.

Attachment and Installation

Product	Description	Temperature Rating*	Flammability	Halogen Free	Design & Construction	Available Sizes
 **Silicone Tape 57**	Self-amalgamating tape used for sealing, connecting and finishing the cut ends of sleeves exposed to high temperature	-60°C to +200°C (-76°F to +392°F)	EN45545-2: R22: HL2 R23: HL2	✓	**Design:** Flat **Material:** Silicone (unsupported) or silicone with fiberglass (supported) **Color:** Black	Max. elongation 300%. 13mm (1/2") wide
 **ROUNDIT® 2000 FR GRIP**	Abrasion protection with self-locating above textile hook surface.	-55°C to +85°C (-67°F to +185°F)	EN45545-2: R22: HL3 R23: HL3	✓	**Design:** Wrappable **Material:** Flame-retardant polyester monofilaments and multifilaments **Color:** Black	3 to 38 mm (3/16" to 1-1/2")

Electromagnetic Interference

Product	Description	Temperature Rating*	Flammability	Halogen Free	Design & Construction	Available Sizes
 **ROUNDIT® V0 EMI**	Self-wrapping metal solution; flexible and easy to install providing high performance EMI shielding	-65°C to +200°C (-85°F to +392°F)	EN45545-2: R22: HL3 R23: HL3 NFPA 130: ASTM E-162 and ASTM E-662	✓	**Design:** Wrappable **Material:** Nickel-plated copper C4 according to ASTM B-355 combined with PPS monofilament **Color:** Light gray	8 to 45 mm (5/16" to 1-3/4")
 **ROUNDIT® V0 EMI CuSn**	Self-wrapping metal solution; flexible and easy to install providing high performance EMI shielding	-40°C to +125°C (-40°F to +257°F)	EN45545-2: R22: HL3 R23: HL3	✓	**Design:** Wrappable **Material:** Tin-plated copper according to EN13602 combined with PPS monofilaments **Color:** Light gray	8 to 45 mm (5/16" to 1-3/4")
 **ROUNDIT® EMI DW**	Self-wrapping metal solution (Cu/Ni Metal); flexible and easy to install providing high performance EMI shielding	-50°C to +200°C (-58°F to +392°F)	EN45545-2: R22: HL3 R23: HL3	✓	**Design:** Wrappable **Material:** Nickel-plated copper according to ASTM B-355 combined with PPS monofilaments **Color:** Light gray	13 to 45 mm (1/2" to 1-3/4")
 **ROUNDIT® EMI FMJ Plus**	Self-wrapping metal solution (Cu/Ni Metal); flexible and easy to install providing high performance EMI shielding	-65°C to +125°C (-85°F to +257°F)	EN45545-2: R22: HL3 R23: HL3	✓	**Design:** Wrappable **Material:** Nickel-plated copper according to ASTM B-355 **Color:** Light gray	8 to 50 mm (5/16" to 1-1/2")

** Temperature ratings may vary due to alternate OEM test requirements*






Testing Capabilities & Virtual Lab

Systems Protection (SP) is committed to providing our customers with outstanding technical support in all stages of the product application process.

From material selection and product development through qualification and application specific testing, our world-class technology centers utilize state-of-the art test equipment to simulate real-life conditions and evaluate the full breadth of our product performance. Our testing capabilities are continually expanding to support our customer's needs and provide evaluation for the following:

- **Acoustical:** sound damping and absorption
- **Crash / Impact:** custom crash scenario simulation, dynamic cut-through, and drop energy
- **EMI (Electromagnetic Interference):** transfer impedance, shielding effectiveness and electrical resistance
- **Environmental:** flammability, smoke density, toxicity, fluids exposure, durability, fogging, stone impingements, salt spray, and humidity
- **Material Analysis:** melting point, specific heat, infrared spectroscopy (FTIR), emissivity, thermal conductivity.
- **Mechanical:** abrasion resistance, tensile strength, elongation, tear strength, vibration resistance, peel strength, flexural strength
- **Thermal:** Thermal effectiveness, thermal containment / insulation, and Thermal Runaway simulation

Virtual Lab

As a value to our customers, SP has created and utilizes a virtual environment to allow design release engineers remote access to our labs to observe live testing and consult with testing staff. This no cost service allows our customers to better understand test methods and set up especially in the event that a relevant test method does not exist. Our teams work to develop new test methods that accurately quantify product performance and can demonstrate in real time for customer approval.

New Product Design & Customization

Systems Protection (SP) takes pride in being a solution provider and partner to our customers by working to deliver the right solution for each application.

We recognize that not every problem can be solved with a single product. By listening to our customers, we gain a better understanding of current industry challenges and are committed to developing new products to meet these demands in the ever-changing marketplace.

SP is continually evolving its product portfolio by drawing from a broad range of capabilities and expertise. Utilizing a variety of different materials, constructions, processes, and design features, we create new innovative products to meet needs for performance, survivability, and installation. Through collaboration with our customers, innovative ideas, and quick prototype fabrication, we deliver the optimal solution for each application.

Materials

Utilizing an extensive materials portfolio and the latest advancements in technology, SP strategically selects and blends unique fibers, coatings, adhesives, and other materials to create cost effective multifunctional designs capable of surviving in extreme conditions while providing varying levels of performance. SP strives to do its part in meeting environmental and eco-friendly initiatives including RoHS and REACH compliance by selecting appropriate materials.

Processes

With our textile foundation encompassing weaving, braiding, knitting and non-woven processes, SP prides itself in utilizing the best textile process for each application. Through variable construction attributes within each textile process, a balance of different metrics including technical performance, durability, install ability, expandability, and use ability can be met.

Adding Value

SP looks to add value to our textiles and products through the incorporation of secondary processes, design features and customization in order to enhance performance and functionality. Lamination and coatings allow designers to add secondary materials to the textile to meet tougher requirements and provide multi-functionality. Custom cutting, notching and forming provide superior fit and aesthetics. The incorporation of adhesive strips, snaps, and custom attachments deliver quick and repeatable installation.

Systems Protection is committed to providing the highest quality systems for our customers, employees, and environment and continues to follow the rigorous requirements needed to maintain several industry certifications.

Global Presence

Americas

GLOBAL INNOVATION CENTER:

United States		Exton, PA

ENGINEERING AND TECHNICAL SERVICES:

United States		Exton, PA

SALES OFFICES:

United States		
Auto	(1) 734 468 3201	Detroit, MI • El Paso, TX
EIT*	(1) 800 926 2472	Exton, PA
Mexico	(52) 442 101 8100	Queretaro

MANUFACTURING LOCATIONS:

United States	El Paso, TX • Exton, PA
Mexico	Queretaro

Europe, Middle East, Africa (EMEA)

ENGINEERING AND TECHNICAL SERVICES:

France	Crépy-en-Valois

SALES OFFICES:

France	(33) 3 44 39 06 06	Crépy-en-Valois • Toulouse
Italy		Chivasso
Spain		Barcelona
Germany		Burscheid • Wiesbaden • Stuttgart

MANUFACTURING LOCATIONS:

France	Crépy-en-Valois
Hungary	Kimle
Morocco	Tangier

*** EIT** markets include Aerospace, Railway, Industrial, Off-Road and other Electronics markets

Asia

ENGINEERING AND TECHNICAL SERVICES:

Japan	Shonan
China	Shanghai

SALES OFFICES:

Japan	(81) 45 330 0300	Nagoya • Yokohama
China	(86) 21 6182 7560	Shanghai • Changchun Guangzhou • Beijing
Thailand	(66) 35 276 400	Ayutthaya
Korea	(82) 44 861 6368	Sejong
India	(91) 124 4784565	Gurgaon, NCR Delhi Chennai

MANUFACTURING LOCATIONS:

Japan	Shonan
China	Changshu
Thailand	Ayutthaya
Korea	Sejong
Vietnam	Haiphong
India	Bhiwadi
Philippines	Laguna

DISTRIBUTION CENTERS:

China	Guangzhou
Indonesia	Jakarta

SYSTEMS PROTECTION™

ISO14001: Environmental Management Systems
ISO 45001: Occupational Health and Safety Management Systems
ISO 9001, IATF 16949, AS/EN 9100: Quality Management Systems

BentleyHarris® Protection Products

www.systemsprotection.com