



TERMINALS



APPLICATORS



HOUSING



HAND TOOLS



CORRUGATED
TUBES



INSULATING
SLEEVINGS



PRESSES



TTR
PRINTERS



AUTOMATIC
TOOLS



IDC
CONNECTORS



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the smartest way to connect.

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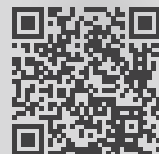
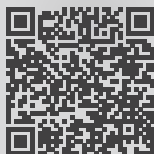
52-028 Wrocław, Poland; ul. Opatowicka 16

NIP: PL 899 229 92 03

Obsługa Klienta | Customer service: **+48 602 234 242**
+48 606 725 122
+48 606 725 175

e-mail: cs@wiresolutions.pl

Dział techniczny | Technical advice: **+48 606 725 982**





relats

Innovative Covering Solutions





innovative covering solutions

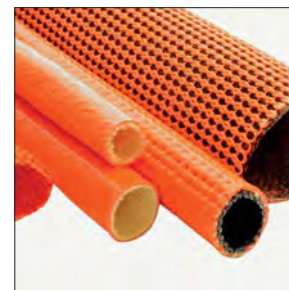
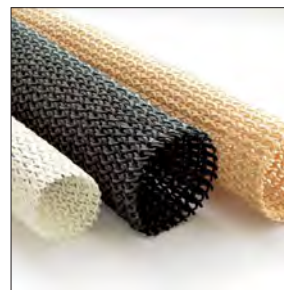
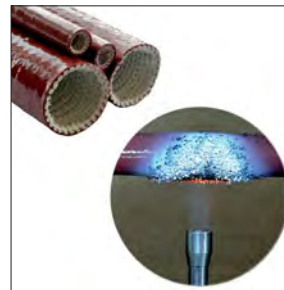
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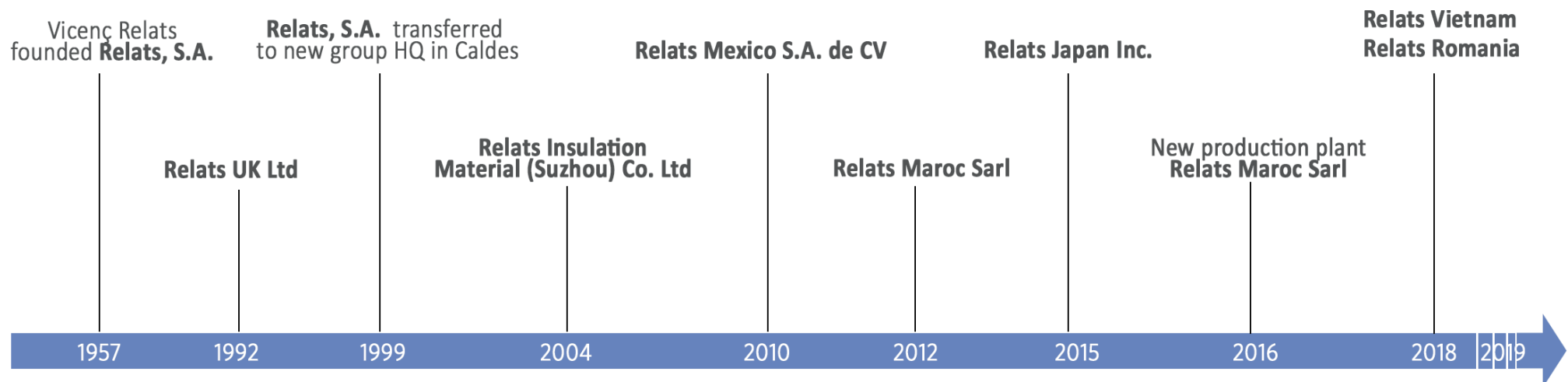
Relats is a multinational Catalan family company with HQ near to Barcelona that is highly internationalized, which designs and produces a range of products with textile substrate systems for engines, brakes, push pull cables, rubber hoses and metal, among many others. With a presence in four continents across six manufacturing plants (in Catalonia, China, Mexico, Morocco, Vietnam and Romania). Relats Group works with companies that supply the main components of global brands in the automotive industry, aerospace, railway, electricity sector, electrical appliances and renewable energy.

Leading manufacturer with global presence of:

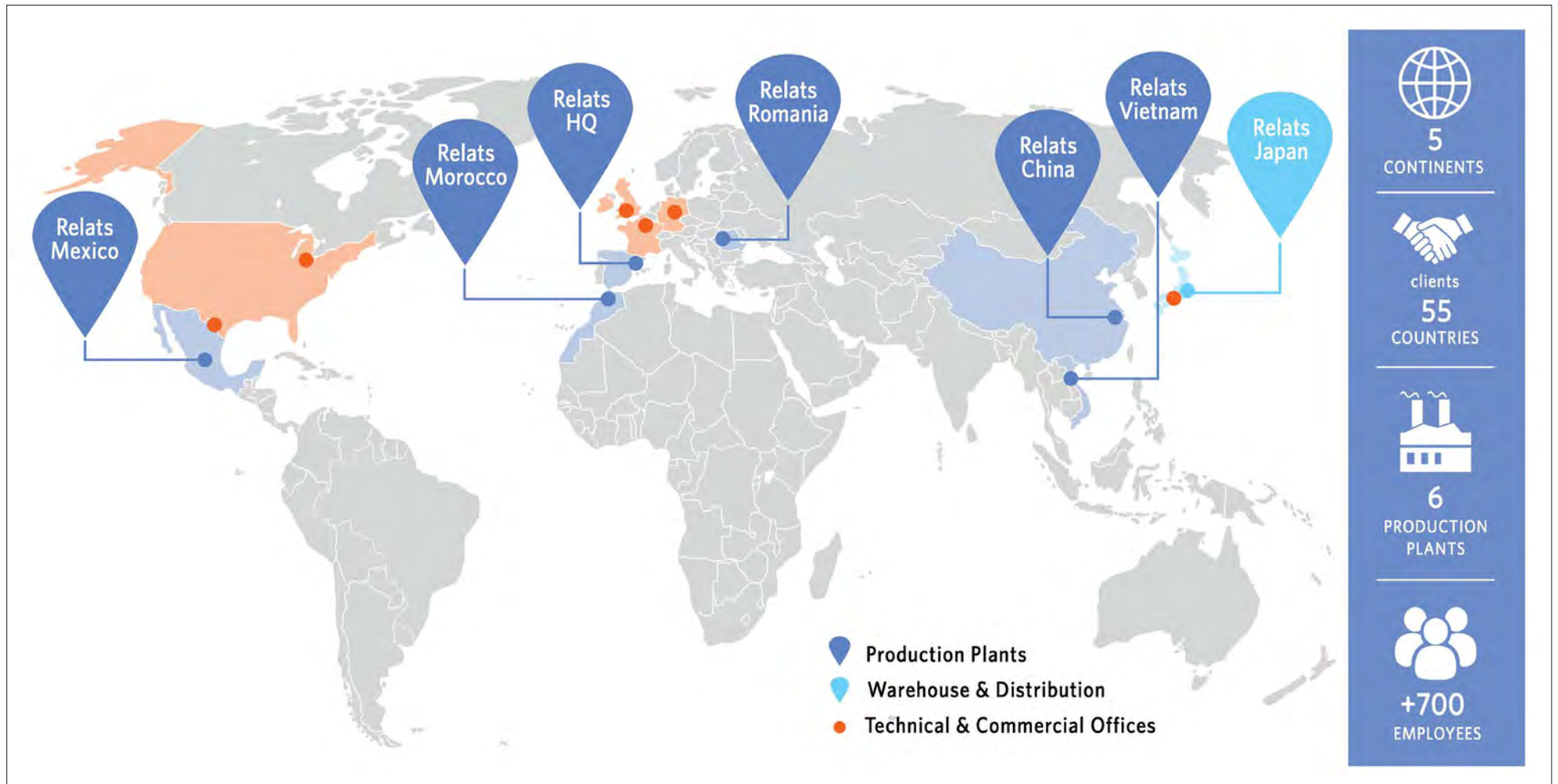
- Electrical and thermal insulating sleeveings
- Mechanical protection and/or noise reduction covers (Self Closing TWS - PLAS family)
- EMI and heat reflective protective components
- Impact protection sleeves



History & milestones



Worldwide presence:



Production Plants



Relats, S.A. - HQ

2016. Relats' headquarters is extended with a new smart warehouse

| | |
|----------------------------|----------------------------|
| Building before expansion: | 7,300 m ² |
| Expansion: | 2,400 m ² |
| Total: | 9,700 m² |



Relats China

June, 2017 - Expansion

| | |
|-------------------|----------------------------|
| Before expansion: | 6,000 m ² |
| Expansion: | 3,000 m ² |
| Total: | 9,000 m² |



Relats Mexico

October, 2017 - Expansion

| | |
|-------------------|----------------------------|
| Before expansion: | 3,500 m ² |
| Expansion: | 3,770 m ² |
| Total: | 7,270 m² |



Relats Morocco

May, 2017 - Transfer to New Production Plant

| | |
|-------------------|-----------------------------|
| Current Plant: | 4,500 m ² |
| New Plant: | 10,000 m² |



Relats Vietnam

June, 2018 - New Production Plant

Total: 7,250 m²

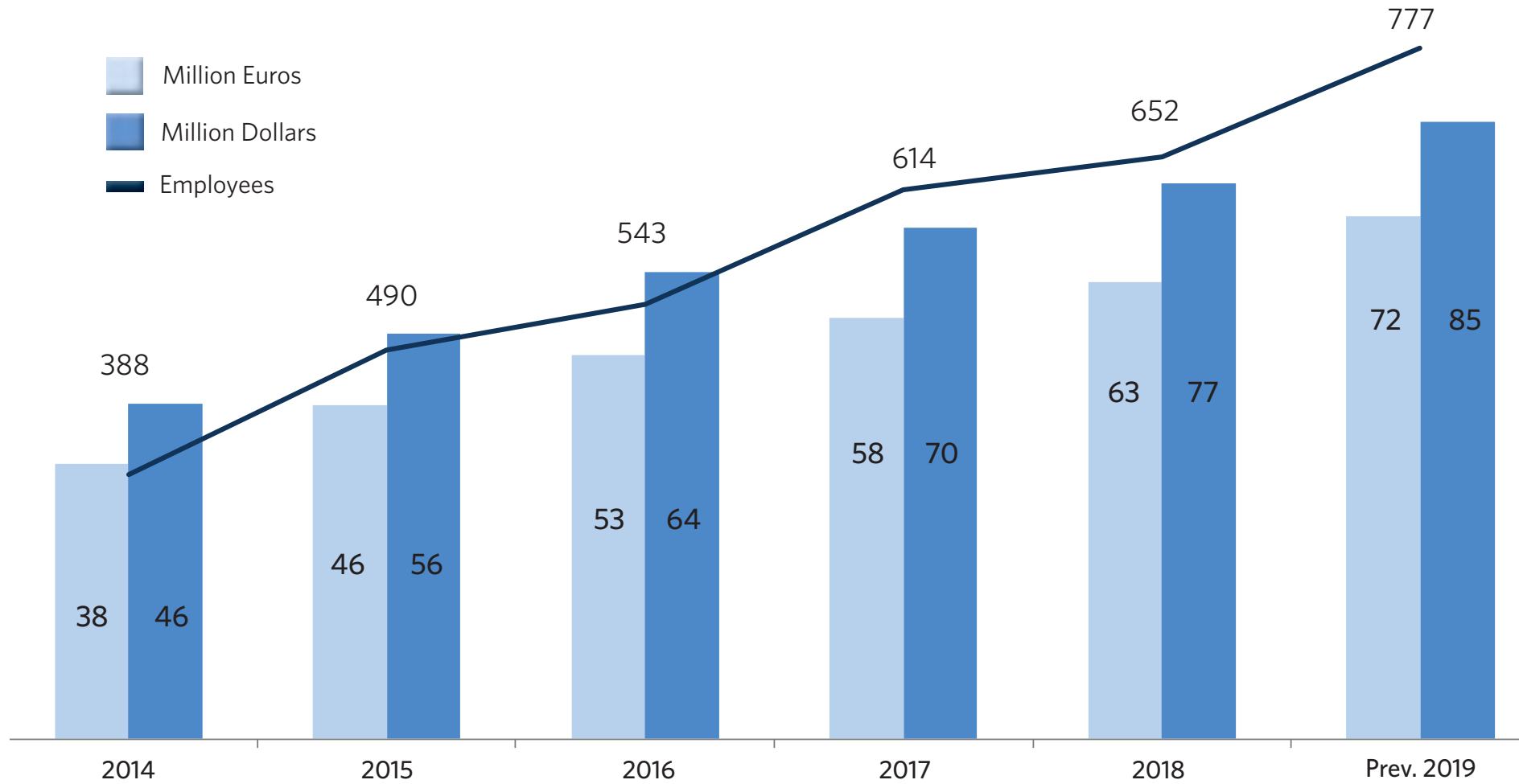


Relats Romania

October, 2018 - New Production Plant

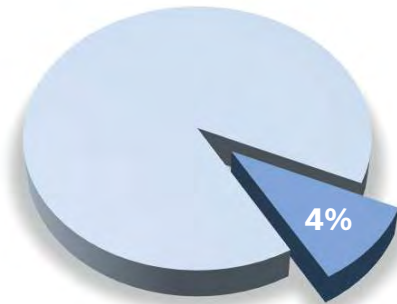
Total: 4,250 m²

Turnover & Employees – Relats Group

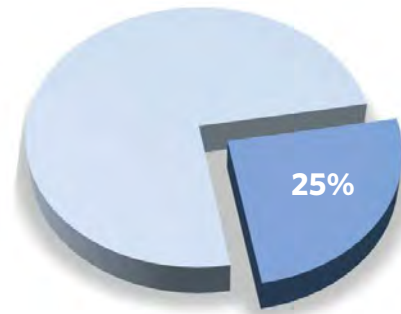


Constant innovation

R&D Investment vs Turnover
(annually)



New Products vs Total Sales
(Products introduced in the market during last 4 years)



- 22 active patents, Avg. 2 new applications every year.
- Collaboration/agreements with technological centers, laboratories and universities.
- In regular consultation with European experts in our speciality.

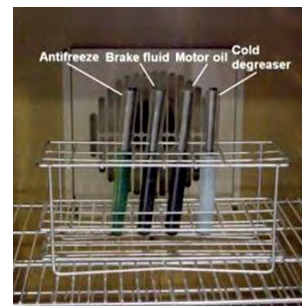
Laboratory capabilities in house



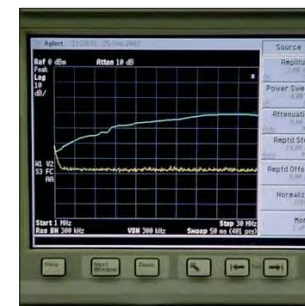
Mechanical tests



Thermal tests



Chemical tests



EMI testing



Physical testing



Crash tests

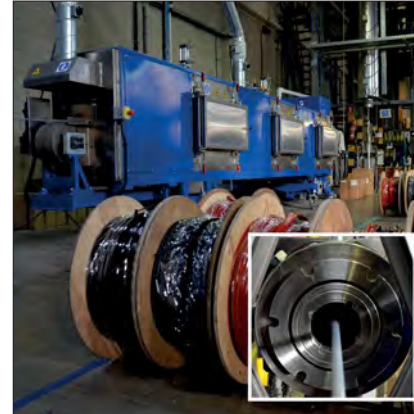
Production process



Braiding, knitting,
knitbraiding



Coating towers



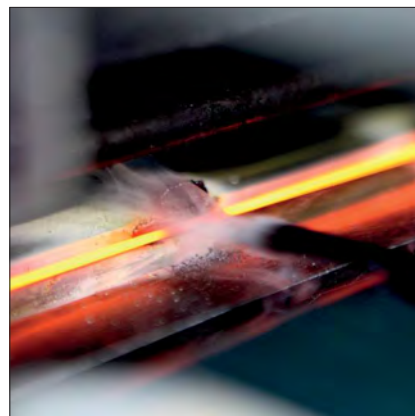
Silicone extrusion



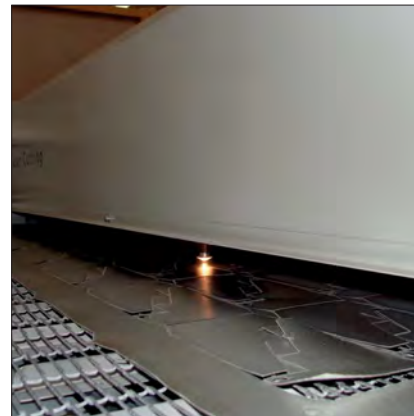
Alu foil laminating



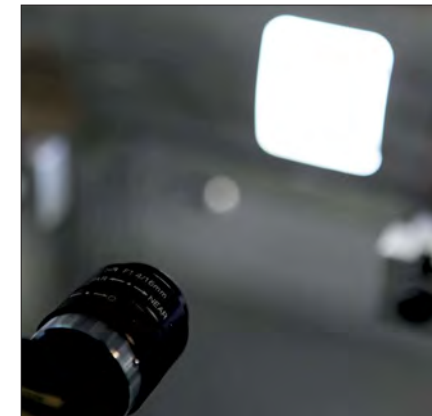
Flat knitting self closing
sleeves



Cutting: Thermal,
mechanical, ultrasonic cut



Heatshields laser cutting




Artificial vision quality
system

AUTOMOTIVE APPLICATIONS

Orange color version available under request for electric (EV) and hybrid electric and plug-in hybrid electric (HEV & PHEV) applications.

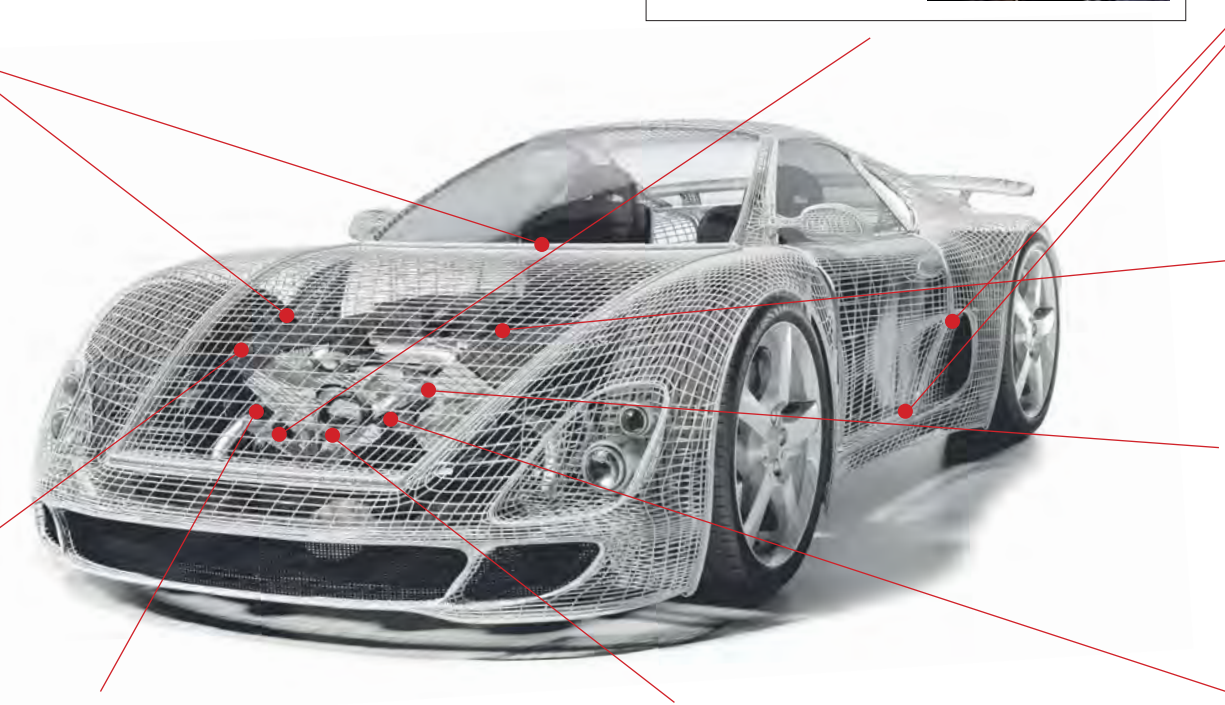
Self Closing TWS
for bundling and mechanical protection of harness cables.

- PLAS7; PLAS8; PLAS8NJ; PLAS8NN; PLAS8 L; PLAF1



Glass Silicone Sleeves
for high temperature applications for example engine sensors or fuel lines.

- VSC25NE; VSC25NE E; VSC25NE HT; VSC25AL, WSR15NE E

Heat Shrinkables

Woven sleeving which after applying heat, shrinks to a snug and secure fit on top of the application.

- Relshrink



Mechanical Protection Braids

Monofilament or Multifilament braids (eg. PET or PA6.6) for mechanical protection applications (eg. hoses, fuel lines). Various expansion ratios available.


- PS; PO; PT; NSG; PNG; PEPO D Durasleeve



EMI Shielding Sleeves

Sleeves offering shielding of electromagnetic interference on high voltage cables (eg. hybrids and electric vehicles).

- NEMI; NEMI CS; NEMI C SIL



Reflective Sleeves

Open or closed aluminium foil laminated sleeves for thermal protection.

- SLEEVE AF; SLEEVE AK; PLAD REFLECT



Supersleeves (EGR's and Heat Socks)

Glass or Quartz fibre sleeves to reduce thermal radiation from exhausts or EGR's.

- SS600; SS600 B; SS1100



Impact Protection Sleeves (IPS)

Various types using glassfibre, polyester or para-aramide. Mechanical protection in extrem conditions.


- VHG10; V2G10; IPS family







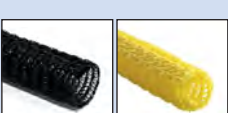


Heatshields

Aluminium foil laminated material customized heatshields for thermal protection, for example connectors or valves.

- Heatshield




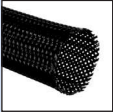






Self Closing TWS







| Product | Description | Material | Temperature | Abrasion | Flammability |
|---|--|--|-----------------|-----------|--------------------|
|  PLAS7 | High performance woven open sleeve with unique wraparound qualities allowing easy cable bundling after wire harness assembly. | Monofilament and Multifilament Polyester | -70°C to +150°C | ■ ■ ■ ■ ■ | Self-extinguishing |
|  PLAS8NE PLAD8 | Woven open lightweight sleeve with unique wraparound qualities allowing easy cable bundling after wire harness assembly. Version with adhesive tape available. | Monofilament and Multifilament Polyester | -70°C to +150°C | ■ ■ ■ ■ □ | Self-extinguishing |
|  PLAS8NA | Woven open sleeve with unique wraparound qualities allowing easy cable bundling after wire harness assembly. | Monofilament and Multifilament Polyester | -70°C to +150°C | ■ ■ ■ ■ □ | Self-extinguishing |
|  PLAS8NJ | Woven open lightweight and extraflexible sleeve with unique wraparound qualities allowing easy cable bundling after wire harness assembly. | Monofilament and Multifilament Polyester | -70°C to +150°C | ■ ■ ■ ■ □ | Self-extinguishing |
|  PLAS8 LITE | Woven open ultra lightweight sleeve with unique wraparound qualities allowing easy cable bundling after wire harness assembly. | Monofilament Polyester | -70°C to +150°C | ■ ■ ■ □ □ | Self-extinguishing |
|  PLAS8NN | Woven open lightweight sleeve with unique wraparound qualities allowing easy cable bundling after wire harness assembly. | Monofilament Polyester and Multifilament Polyamide | -70°C to +125°C | ■ ■ ■ ■ □ | Self-extinguishing |
|  PLAF1 | Woven open sleeve, with convoluted surface, flexible with unique wraparound qualities allowing easy cable bundling after wire and harness assembly. | Monofilament and Multifilament Polyester | -70°C to +150°C | ■ □ □ □ □ | Self-extinguishing |



Mechanical Protection Braids



| Product | Description | Material | Expansion ratio | Temperature | Abrasion | Flammability |
|---|---|--|-----------------|-----------------|-----------|--------------------|
|  Periflex PO | Highly expandable braided sleeving mainly meant for applications of mechanical protection. | Monofilament Polyester | 1:3 | -70°C to +150°C | ■ ■ □ □ □ | Self-extinguishing |
|  Periflex PS | Expandable braided sleeving mainly meant for applications of mechanical protection. | Monofilament Polyester | 1:2 | -70°C to +150°C | ■ ■ ■ □ □ | Self-extinguishing |
|  Periflex PT | Tighter expandable braided sleeving mainly meant for applications of mechanical protection. | Monofilament Polyester | 1:1,3 | -70°C to +150°C | ■ ■ ■ ■ □ | Self-extinguishing |
|  Periflex NSG | Expandable braided sleeving mainly meant for applications of mechanical protection. | Monofilament Polyamide | 1:2 | -70°C to +150°C | ■ ■ ■ ■ ■ | Self-extinguishing |
|  Periflex PNG | Expandable braided sleeving made of thick yarns mainly meant for applications of mechanical protection. | Monofilament Polyester and Polyamide | 1:2 | -70°C to +150°C | ■ ■ ■ ■ ■ | Self-extinguishing |
|  Periflex Durasleeve | Expandable braided sleeving for mechanical protection. Due to the special disposition of the yarns the coverage of this sleeving is almost 100% in all of its expansion range. Good sound dampening properties. | Multifilament Polyester | 1:2 | -70°C to +150°C | ■ ■ ■ ■ ■ | Self-extinguishing |
|  Periflex NEPO/PEPO | Expandable braided sleeving able to maintain a high degree of surface coverage when expanded so facilitating the jacketing of cables, etc. Excellent sound dampening properties. | Monofilament and Multifilament Polyester | 1:3 | -70°C to +150°C | ■ ■ □ □ □ | Self-extinguishing |
|  Periflex PEPO D | Expandable braided sleeving . Due to its resilience it recovers quickly to its initial diameter. Excellent sound dampening properties. | Monofilament and Multifilament Polyester | 1:1,3 | -70°C to +150°C | ■ ■ ■ ■ □ | Self-extinguishing |






Reflective Sleeves

| Product | Description | Material | Temperature | Thermal Efficiency (SAE J2302) | Flammability |
|---|---|--|------------------------|---|---------------------------|
|  <p>Revitex Sleeve AF</p> | <p>Braided sleeving with aluminium foil which refracts radiation heat and provides excellent insulating properties.</p> | <p>Fibreglass and Aluminium Foil</p> | <p>-70°C to +200°C</p> |  | <p>Self-extinguishing</p> |
|  <p>Revitex Sleeve AR</p> | <p>Knitted sleeving covered with aluminium foil adhesive tape which refracts radiation heat and provides excellent insulating properties.</p> | <p>Fibreglass and Aluminium foil</p> | <p>-70°C to +200°C</p> |  | <p>Self-extinguishing</p> |
|  <p>Plad Reflect</p> | <p>Braided open self closing sleeve with aluminium foil and paper backed adhesive tape along the edge to allow the product to be closed into a tube or wrapped around bundles of cables and closed along the edge. Product mainly meant for thermal protection.</p> | <p>Fibreglass, Polyester Monofilament and Aluminium Foil plus Adhesive Closure</p> | <p>-70°C to +200°C</p> |  | <p>Self-extinguishing</p> |










| Product | Description | Material | Temperature | Thermal Efficiency (SAE J2302) | Flammability |
|---|--|--------------------------------------|--|---|---------------------------|
|  <p>Heatshield</p> | <p>Customized heatshields (special laser cutting) made of fibreglass substrate laminated with aluminium foil. Various types of substrates are available. Heatshields can be with button snaps, adhesive tapes (partial or full covering) and sown with glass or aramide yarns. Product designed for thermal protection of connectors and other components.</p> | <p>Fibreglass and Aluminium Foil</p> | <p>-70°C to +200°C</p> <hr/> <p>-70°C to +250°C</p> <hr/> <p>-70°C to +300°C</p> |  | <p>Self-extinguishing</p> |












Glass Silicone Sleeves

| Product | Description | Material | Temperature | Thermal Efficiency (SAE J2302) | Flammability |
|--|---|-------------------------|-------------------------------------|--------------------------------|--------------------|
|  Revitex VSC25 | Sleeving made of a special silicone rubber coated fiberglass braid. | Fiberglass and silicone | -70°C to +235°C (Peaks at 300°C) | ■ ■ □ □ □ | Self-extinguishing |
|  Revitex VSC25 E | Sleeving made of a extruded silicone rubber coated fiberglass braid. | Fiberglass and silicone | -70°C to +225°C (Peaks at 300°C) | ■ ■ □ □ □ | Self-extinguishing |
|  Revitex VSC25 AL | Sleeving coated with silicone rubber containing heat reflecting aluminium pigments. The aluminium coating reflects radiating heat, whereas at the same time fiberglass braid inside provides excellent insulating properties. | Fiberglass and silicone | -70°C to +235°C (Peaks at 300°C) | ■ ■ ■ □ □ | Self-extinguishing |
|  Revitex VSC25 HT | Sleeving made of a high temperature extruded silicone rubber coated fiberglass braid. | Fiberglass and silicone | -70°C to +250°C | ■ ■ □ □ □ | Self-extinguishing |
|  Revitex WSR15 | Fiberglass knitted sleeving impregnated and coated with special extruded silicone rubber. | Fiberglass and silicone | -70°C to +210°C (Peaks at 300°C) | ■ ■ □ □ □ | Self-extinguishing |

Impact Protection Sleeves (IPS)









| Product | Description | Material | Temperature | Abrasion | Crash | Flammability |
|---|--|---|-----------------|-----------|-----------|--------------------|
|  Revitex VHG10 V2G10 | Heat treated thick wall braided fiberglass sleeving impregnated with silicone varnish. Good thermal performance. Double wall version available. | Fiberglass and silicone | -70°C to +350°C | ■ □ □ □ □ | ■ ■ □ □ □ | Non Combustible |
|  IPS00 | Braided sleeve made of polyester fibers with a special design that together with its coating provides exceptional impact protection properties. | Polyester yarns and resin | -70°C to +150°C | ■ ■ ■ ■ □ | ■ ■ □ □ □ | Self-extinguishing |
|  IPS40 | Braided sleeve made of multifilament para-aramid fibers and fibreglass yarn with an aramide over-knit that together with its impregnation provides impact protection properties. | 60% Para-aramid fibers, 40% fiberglass and resin | -70°C to +180°C | ■ ■ ■ ■ □ | ■ ■ ■ □ □ | Self-extinguishing |
|  IPS50 | Reverse knitted para-aramid sleeve with a special design that together with its coating provides exceptional impact properties. | Para-aramid fibers and resin | -70°C to +180°C | ■ ■ ■ □ □ | ■ ■ ■ □ □ | Self-extinguishing |
|  IPS55 | Reverse knitted para-aramid and polyester sleeve with a special design that together with its coating provides exceptional impact properties. | 40% multifilament para-aramid fibers and 60% multifilament of polyester and resin | -70°C to +180°C | ■ ■ ■ □ □ | ■ ■ ■ □ □ | Self-extinguishing |
|  IPS60 | Sleeving made of multifilament para-aramid fibers and silicone coating intended for mechanical and impact protection for protection of cable bundles against impact. | Para-aramid fibers and silicone | -70°C to +180°C | ■ ■ □ □ □ | ■ ■ ■ □ □ | Self-extinguishing |
|  IPS65 | Braided sleeve composed of para-aramid and fiberglass yarns with a special design that together with his coating provides exceptional impact protection properties. | 70% Para-aramid fibers, 30% fiberglass and silicone | -70°C to +180°C | ■ ■ □ □ □ | ■ ■ ■ ■ □ | Self-extinguishing |
|  IPS80 | Sleeving made of fiberglass braid impregnated as an internal layer. As second external layer made of a knitted para-aramid multifilament yarn and coated with silicone. | Para-aramid fibers, fiberglass and silicone | -70°C to +180°C | ■ ■ ■ ■ □ | ■ ■ ■ ■ ■ | Self-extinguishing |
|  Self Closing Shock Shield | Woven open sleeve with cushion effect high closing force . The material possesses unique wraparound qualities allowing easy cable bundling after wire harness assembly. | Monofilament and Multifilament Polyester | -70°C to +150°C | ■ ■ ■ ■ □ | ■ ■ ■ ■ □ | Self-extinguishing |

EMI Shielding Sleeves



| Product | Description | Material | Temperature | Abrasion | Transfer Impedance | Flammability |
|---|---|---|-----------------|---|---|--------------------|
|  Periflex NEMI | Braided sleeving composed of polyester multifilament and tin-copper wire mainly meant for applications of electromagnetic protection and thermal insulation. | Multifilament Polyester and Tin-copper wire | -70°C to +150°C |  |  | Self-extinguishing |
|  Periflex NEMI CS | Braided sleeving composed of 100% tin-copper wire mainly meant for applications of electromagnetic protection and thermal insulation. | Tin-copper wire | -70°C to +200°C |  |  | Self-extinguishing |
|  Periflex NEMI C SIL | Braided sleeving composed of tin-copper wire coated with extruded silicone rubber mainly meant for applications of electromagnetic protection and thermal insulation. | Tin-copper wire and silicone | -70°C to +200°C |  |  | Self-extinguishing |

Supersleeves (EGR's and Heat Socks)



| Product | Description | Material | Temperature | Thermal Efficiency (SAE J2302) | Flammability |
|--|---|--|------------------|---|--------------------|
|  Supersleeve 600 | Patented combination of glass knitbraided sleeving and special impregnant. The material expands approx. 50% and fits snugly on tight bends. Exceptional retention of mechanical properties at elevated temperatures. Various expandable versions available. | Fiberglass and silicone | -70°C to +650°C |  | Self-extinguishing |
|  Supersleeve 600B | Patented combination of fiberglass braided sleeving and special impregnant. The material expands approx. 50%. Exceptional retention of mechanical properties at elevated temperatures. | Fiberglass and silicone | -70°C to +650°C |  | Self-extinguishing |
|  Supersleeve 600 Wrap | Open sleeving, combination of fiberglass with special impregnant. It is a sandwich structure of glass plus insulation material that provides excellent thermal efficiency | Fiberglass, insulation material and silicone | -70°C to +650°C |  | Self-extinguishing |
|  Supersleeve 1100 | Patented combination of silica knitbraid sleeving and special impregnant. The material expands approx. 50% and fits snugly on tight bends. Exceptional retention of mechanical properties at extreme temperatures. | Silica and silicone | -70°C to +1100°C |  | Self-extinguishing |

Heat Shrinkables

| Product | Description | Material | Shrink ratio | Temperature | Abrasion | Flammability |
|--|---|-----------------------------------|--------------|------------------------|---|----------------------|
|  <p>RELSHRINK</p> | <p>Woven sleeving made of polyester multifilament and polyolefin filaments which after applying heat, shrinks to a snug and secure fit on top of the application.</p> | <p>Polyester & polyolefin</p> | <p>2:1</p> | <p>-70°C to +125°C</p> |  | <p><100mm/min</p> |

Automotive Customers

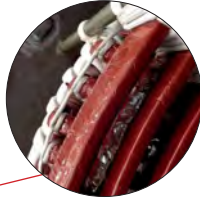
OEM



1st TIER



Windmill Industry



Glass Silicone Sleeves

For electrical insulation applications.

- Revitex VSC25/VSC75/VSX40/VSX75/VSC99

For electrical and mechanical insulation applications

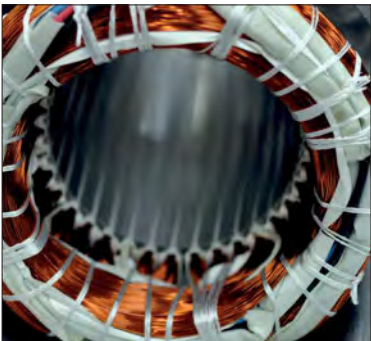
- Revitex V2A

Glass & Polyester Cords

For electrical machines armature banding.

- Revitex Therm Support Cord; Revitex V0000

EV, HEV & PHEV Motors



Silicone Sleeves & Tie Cords

Sleeves for electrical insulation of EV, HEV & PHEV motors and Tie Cord to tie the winding due to its mechanical resistance and high compatibility with the resins used in motors.

- Revitex V2V / Revitex Silcup; Tie Cord

Steel Industry



Glass Silicone Sleeves

Open and closed sleeves for fire protection of electrical cable and cable bundles to ensure the electrical characteristics will not be degraded.

- VSC75 Fire Pro; Fire Pro SC HP

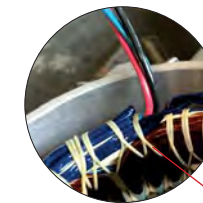
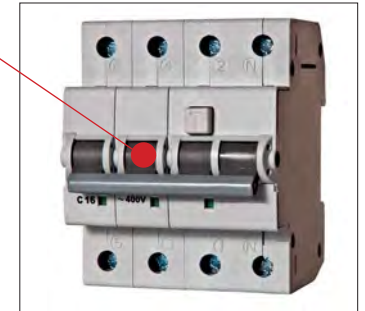
Circuit Breakers



Glass Acrylic Sleeves

For isolation of thermal bimetals, heat conductors. Mainly used on motor protection switches, automatic circuit breakers.

- Revitex Bimetal Cover

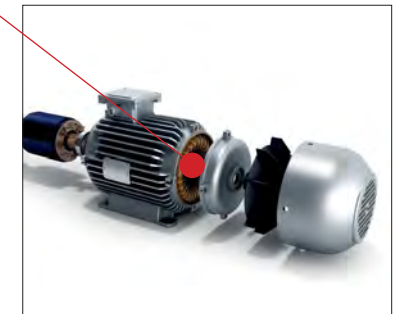


Glass Acrylic & Polyurethane Sleeves




For protection of electrical connections and thermals because of its compatibility with impregnating varnishes.

- Revitex VPG40 / VPG80; Revitex VAC30 / VAC40 / VAC80


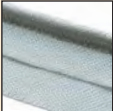


Electrical Power Units



Mechanical Protection Braids


| Product | Description | Material | Expansion ratio | Temperature | Flammability |
|--|--|-------------------------|-----------------|-----------------|--------------------|
|  Periflex PS V0 | Expandable braided sleeving mainly meant for applications of mechanical protection. | Monofilament Polyester | 1:2 | -70°C to +150°C | UL94 V0 |
|  Periflex PO V0 | Highly expandable braided sleeving mainly meant for applications of mechanical protection. | Monofilament Polyester | 1:3 | -70°C to +150°C | UL94 V0 |
|  Periflex Dura HA | Flexible sleeving intended for high mechanical protection. Due to its dense woven construction provides 100% coverage. | Multifilament Polyamide | -- | -70°C to +125°C | Self-Extinguishing |

Glass & Polyester Cords



| Product | Description | Material | Temperature | Flammability |
|--|--|--------------------------|-----------------|--------------------|
|  Revitex Therm Support Cord | Sleeving made of a bundle of E-glass yarn with a braided polyester yarn covering. | Fiberglass and Polyester | -70°C to +180°C | DNA |
|  Revitex Therm Tape Cord | Sleeving made of woven fiberglass tape and fully encapsulated knitbraided fiberglass yarn filled with textured fiberglass threads. | Fiberglass | -70°C to +600°C | Self-Extinguishing |
|  Polyester Sleeve Bopu | Expandable braided sleeving with coverage almost 100%. | Multifilament Polyester | -70°C to +150°C | Self-Extinguishing |
|  Revitex V0000 | Heat treated braided sleeving. Sleeving provides air space insulating only. | Fiberglass | -70°C to +550°C | Incombustible |

Gaskets




| Product | Description | Material | Temperature | Flammability |
|---|--|--|-----------------|--------------|
|  Revitex Therm | Braided or knitbraided fibreglass yarn, impregnated or not, unfilled or filled with textured fibreglass yarn or stainless steel metal mesh and optionally with paper backed adhesive tape. | Fiberglass, Stainless Steel, Paper Backed Adhesive | -70°C to +600°C | Fire Proof |

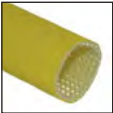



Polyester Impregnated Sleeves

| Product | Description | Material | Temperature | Flammability | Abrasion |
|---|--|----------------------------|-----------------|--------------|---|
|  Polycryl PAC | Braided polyester sleeving impregnated with acrylic varnish. This is a Class B electrical insulating sleeving available in two voltage grades. | Polyester yarn and Acrylic | -70°C to +180°C | DNA |  |

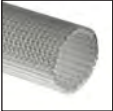

Glass Impregnated Sleeves

| Product | Description | Material | Temperature | Flammability | UL |
|---|---|-------------------------|-----------------|---------------|---------------|
|  Revitex VSR10 | Braided fiberglass sleeving impregnated with silicone varnish. Sleeving provides air space insulation only. | Fiberglass and silicone | -70°C to +300°C | Incombustible | UL recognized |





Glass Acrylic Sleeves

| Product | Description | Material | Temperature | Flammability | UL |
|---|--|---------------------------------------|-----------------|--------------------------------|---------------|
|  Revitex VAC30 | Braided fiberglass sleeving coated with acrylic resin. This is a Class F electrical insulating sleeving. | Fiberglass and Acrylic | -70°C to +155°C | Extinguishes within 60 sec. VW | -- |
|  Revitex VAC40 | Braided fiberglass impregnated sleeving coated with acrylic resin. This is a Class F electrical insulating sleeving. | Fiberglass and Acrylic | -70°C to +155°C | Extinguishes within 60 sec. VW | UL recognized |
|  Revitex VAC80 | Braided fiberglass impregnated sleeving coated with acrylic resin. This is a Class F electrical insulating sleeving. | Fiberglass and Acrylic | -70°C to +155°C | Extinguishes within 60 sec. VW | UL recognized |
|  Revitex Bimetal Cover | Flat or Round Fiberglass braid which is usually treated with an inorganic impregnation. | Fiberglass and Inorganic Impregnation | -70°C to +300°C | Self-Extinguishing | -- |





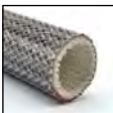
Silicone, Acrylic & Polyurethane Sleeves







| Product | Description | Material | Temperature | Flammability | UL |
|--|--|--|------------------------|---------------------------|----------------------|
|  <p>Revitex GUF VPG 40/80</p> | <p>Braided fiberglass sleeving coated with polyurethane varnish.</p> | <p>Fiberglass and Polyurethane</p> | <p>-70°C to +155°C</p> | <p>HS</p> | <p>UL recognized</p> |
|  <p>Revitex V2A 25</p> | <p>Sleeving made of fiberglass braid coated with silicone rubber as a first internal layer. As second external layer made of a braided polyester sleeving with acrylic impregnation.</p> | <p>Fiberglass, Polyester, Silicone and Acrylic</p> | <p>-70°C to +155°C</p> | <p>Self-Extinguishing</p> | <p>--</p> |

Glass Silicone Sleeves

| Product | Description | Material | Expansion Ratio | Temperature | Flammability | UL |
|--|---|-------------------------|-----------------|-----------------|--------------------|---------------|
|  Revitex VSC25/75 | Sleeving made of a special silicone rubber coated fiberglass braid. | Fiberglass and silicone | -- | -70°C to +235°C | Self-Extinguishing | UL recognized |
|  Revitex VSX40 | Sleeving made of a special silicone rubber, its unique construction allows expanding 1.6 times its original size. | Fiberglass and silicone | 1: 1,6 | -70°C to +235°C | Self-Extinguishing | -- |
|  Revitex V SX75 | Sleeving made of a special silicone rubber coated fiberglass braid, with allows to expand it to the double of its original size | Fiberglass and silicone | 1:2 | -70°C to +235°C | Self-Extinguishing | UL recognized |
|  Revitex VSC99 | Sleeving made of a special silicone rubber thick coated fiberglass braid that guarantees a high dielectric strength | Fiberglass and silicone | -- | -70°C to +235°C | Self-Extinguishing | -- |

Glass Silicone Sleeves

| Product | Description | Material | Temperature | Flammability |
|--|--|---|-----------------|--------------------|
|  Revitex VSCTE | Fiberglass sleeving, thick wall, coated with self extinguishing silicone rubber, that guarantees a high degree of thermal insulation | Fiberglass and silicone | -70°C to +235°C | Self-Extinguishing |
|  Revitex VSCTF | Fiberglass knitbraided sleeving, thick wall, coated with self extinguishing and fire resistant silicone rubber, that guarantees a high degree of thermal insulation and fire protection. | Fiberglass and fire resistant silicone | -70°C to +235°C | Self-Extinguishing |
|  FIRE PRO SC | Self closing fiberglass and polyester sleeving coated with self-extinguishing and fire resistant special silicone rubber, that guarantees a high degree of thermal insulation and fire protection. | Fiberglass, polyester and fire resistant silicone | -70°C to +200°C | Self-Extinguishing |
|  Revitex Silcup | Sleeving made of a special silicone rubber coated fiberglass braid with one end bonded with silicone. | Fiberglass and silicone | -70°C to +235°C | Self-Extinguishing |
|  Revitex V2V | Sleeving made of fiberglass braid coated with silicone rubber as a first internal layer. As second external layer made of a braided fiberglass sleeving with silicone impregnation. | Fiberglass and silicone | -70°C to +200°C | Self-Extinguishing |

| Product | Description | Material | Temperature | Flammability | Tensile Strength | ATF Oil Compatibility |
|---|--|-------------------------|------------------------|---------------------------|---|---------------------------------------|
|  <p>Tie Cord Nomex®</p> | <p>Braided sleeving made of Nomex® for tie motors, intended for mechanical resistance and high compatibility with resins.</p> | <p>Nomex® yarn</p> | <p>-70°C to +180°C</p> | <p>Self-Extinguishing</p> |  | <p>Tensile Strength Retention 70%</p> |
|  <p>Tie Cord PPS</p> | <p>Braided sleeving made of PPS for tie motors, intended for mechanical resistance and high compatibility with resins.</p> | <p>PPS yarn</p> | <p>-70°C to +180°C</p> | <p>Self-Extinguishing</p> |  | <p>Tensile Strength Retention 70%</p> |
|  <p>Tie Cord Para-aramid</p> | <p>Braided sleeving made of Para-aramid for tie motors, intended for mechanical resistance and high compatibility with resins.</p> | <p>Para-aramid yarn</p> | <p>-70°C to +180°C</p> | <p>Self-Extinguishing</p> |  | <p>Tensile Strength Retention 70%</p> |

Industrial & Energy Customers

SIEMENS



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ELECTRIC MOTORS

LINCOLN
ELECTRIC



B/S/H/

ENERCON
ENERGY FOR THE WORLD

ABB

Rolls-Royce

SEW
USOCOME

Indar

Gamesa



Self Closing

for bundling and mechanical protection of harness cables.

- PLA17 V0 RW; PLA17 AS RW

Mechanical Protection Braids

Monofilament or Multifilament braids (eg. PET or PA6.6) for mechanical protection applications (eg. hoses, fuel lines). Various expansion ratios available.

- PS V0 RW; PS O RW; NSG RW

EMI Shielding Sleeves

Sleeves offering shielding of electromagnetic interference on high voltage cables.

- Emi Shield PRO RW; Emi Shield RW, Dura Emi RW

Reflective Sleeves

Open or closed aluminium foil laminated sleeves for thermal protection.

- Revitex SLEEVE AF

Glass Silicone Sleeves

for high temperature applications for example engine sensors or fuel lines.

- VSC25/40/75 RW; VSC99 RW; VSCTE RW; VSCTF RW; FIRE PRO SC RW

Glass Impregnated Sleeves

High oxygen index impregnated sleeves to provide insulation at high temperatures

- VSR10 RW; VSR10 Expandable Version RW

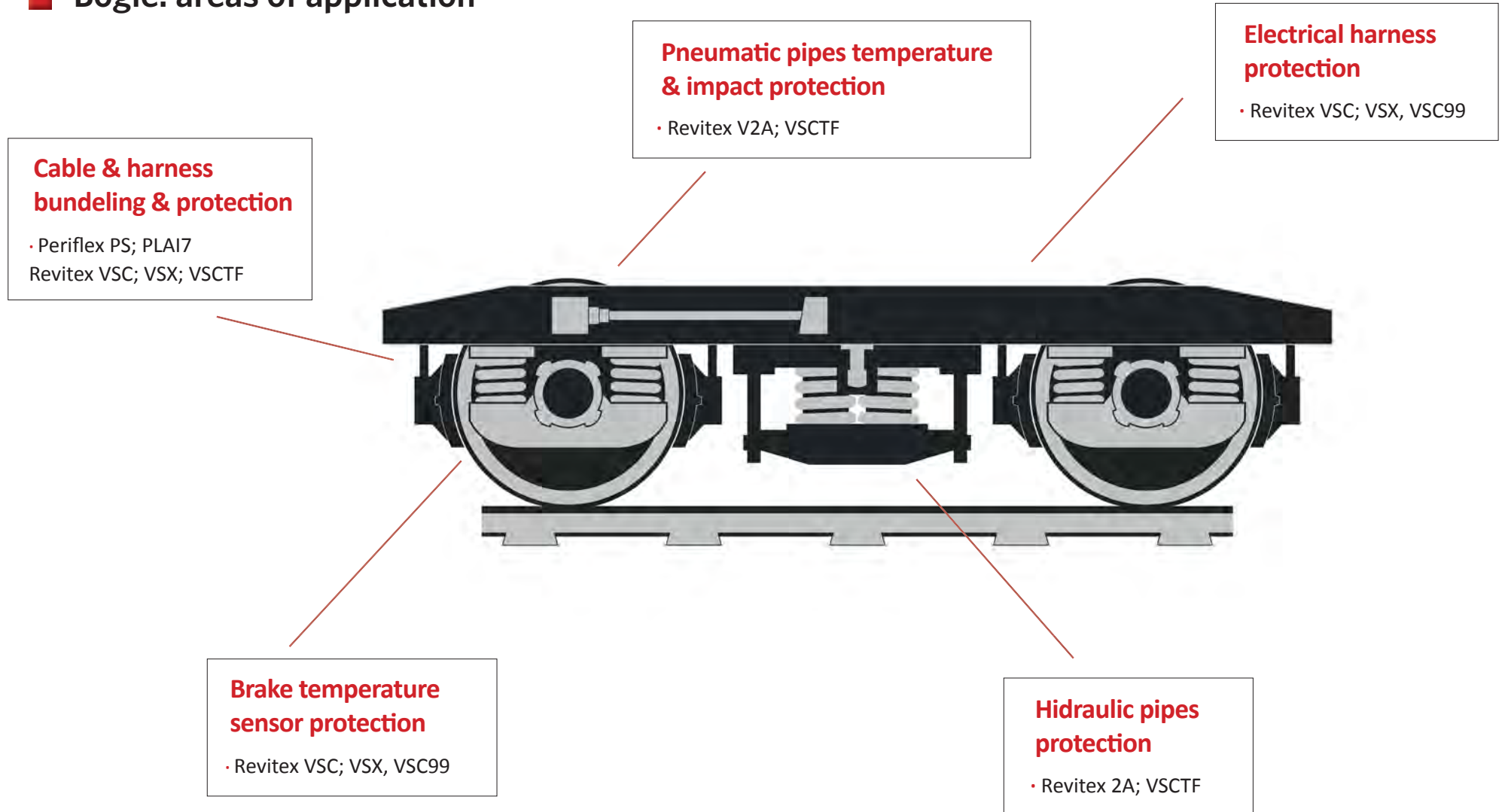
Heatshields

Aluminium foil laminated material customized heatshields for thermal protection, for example connectors or valves.





- Heatshield




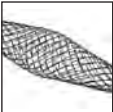
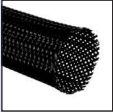
■ Bogie: areas of application




Self Closing

| Product | Description | Material | Temperature | Abrasion | Fire Behaviour EN 45545 |
|--|--|--|------------------------|---|---|
|  <p>PLAI7 V0 RW</p> | <p>Woven open sleeve made of flame-retardant fibers with unique wraparound qualities allowing easy cable bundling after wire harness assembly.</p> | <p>Monofilament and Multifilament Polyester</p> | <p>-70°C to +150°C</p> |  | <p>R22&R23 Hazard Level HL1, HL2, HL3</p> |
|  <p>PLAI7 AS RW</p> | <p>Woven open sleeve made of flame-retardant fibers and aluminium foil inside with unique wraparound qualities allowing easy cable bundling after wire harness assembly.</p> | <p>Monofilament and Multifilament Polyester and aluminium foil</p> | <p>-70°C to +150°C</p> |  | <p>R22&R23 Hazard Level HL1, HL2, HL3</p> |


Mechanical Protection Braids

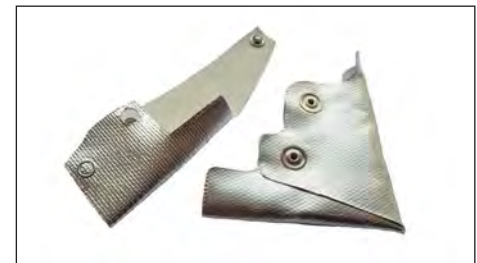
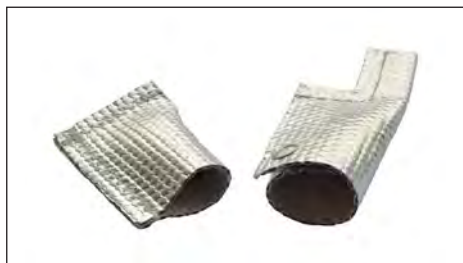
| Product | Description | Material | Expansion ratio | Temperature | Abrasion | Fire Behaviour EN 45545 |
|---|--|------------------------|-----------------|-----------------|-----------|---|
|  Periflex PS VO RW | Expandable braided sleeving made of flame retardant fibers mainly meant for applications of mechanical protection. | Monofilament Polyester | 1:2 | -70°C to +150°C | ■ ■ ■ □ □ | R22&R23 Hazard Level: HL1, HL2, HL3 |
|  Periflex PS O RW | Highly expandable braided sleeving mainly meant for allowing easy cable bundling after wire and harness assembly. | Monofilament Polyester | 1:3,6 | -70°C to +150°C | ■ □ □ □ □ | R22&R23 Hazard Level: HL1, HL2, HL3 |
|  Periflex NSG RW | Expandable braided sleeving mainly meant for applications of mechanical protection. | Monofilament Polyamide | 1:2 | -70°C to +150°C | ■ ■ ■ ■ ■ | R22 Hazard Level: HL1, HL2 R23 Hazard Level: HL1, HL2, HL3 |

Reflective Sleeves






| Product | Description | Material | Temperature | Thermal Efficiency (SAE J2302) | Fire Behaviour EN 45545 |
|---|--|-------------------------------|-----------------|--------------------------------|-------------------------|
|  Revitex Sleeve AF | Braided sleeving with aluminium foil which refracts radiation heat and provides excellent insulating properties. | Fibreglass and Aluminium Foil | -70°C to +200°C | ■ ■ ■ ■ □ | Self-extinguishing |

Heatshields


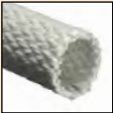
| Product | Description | Material | Temperature | Thermal Efficiency (SAE J2302) | Fire Behaviour EN 45545 |
|---|---|-------------------------------|-----------------|--------------------------------|-------------------------|
|  Revitex End Fit V AF (Heatshield) | Customized heatshields made of fibreglass substrate laminated with aluminium foil. Various types of substrates are available. Heatshields can be with button snaps, adhesive tapes (partial or full covering) and sown with glass or aramide yarns. Product designed for thermal protection of connectors and other components. | Fibreglass and Aluminium Foil | -70°C to +200°C | ■ ■ ■ ■ □ | Self-extinguishing |
| | | | -70°C to +250°C | | |
| | | | -70°C to +300°C | | |






Glass Silicone Sleeves

| Product | Description | Material | Temperature | Fire Behaviour EN 45545 |
|--|--|---|-----------------|--|
|  Revitex VSC25/40/75 RW | Sleeving made of a special silicone rubber coated fiberglass braid. This is a Class 200 electrical insulating sleeving available in three voltage grades. | Fiberglass and silicone | -70°C to +235°C | R22&R23 Hazard Level: HL1, HL2, HL3 |
|  Revitex VSC99 RW | Sleeving made of a special silicone rubber thick coated fiberglass braid that guarantees a high dielectric strength. | Fiberglass and silicone | -70°C to +235°C | DNA |
|  Revitex VSCTE RW | Fiberglass sleeving, thick wall, coated with self extinguishing silicone rubber, that guarantees a high degree of thermal insulation. | Fiberglass and silicone | -70°C to +235°C | DNA |
|  Revitex VSCTF RW | Fiberglass knitbraided sleeving, thick wall, coated with self extinguishing and fire resistant silicone rubber, that guarantees a high degree of thermal insulation and fire protection. | Fiberglass and fire resistant silicone | -70°C to +235°C | R22 Hazard Level: HL1, HL2 R23 Hazard Level: HL1, HL2 HL3 |
|  FIRE PRO SC RW | Self closing fiberglass and polyester sleeving coated with self-extinguishing and fire resistant special silicone rubber, that guarantees a high degree of thermal insulation and fire protection. | Fiberglass, polyester and fire resistant silicone | -70°C to +200°C | R22 Hazard Level: HL1, HL2 R23 Hazard Level: HL1, HL2 |

Glass Impregnated Sleeves

| Product | Description | Material | Expansion ratio | Temperature | Fire Behaviour EN 45545 |
|--|---|--------------------------------|-----------------|------------------------|--|
|  <p>Revitex VSR10 RW</p> | <p>Braided fiberglass sleeving impregnated with silicone varnish. Sleeving provides air space insultaion only.</p> | <p>Fiberglass and silicone</p> | <p>--</p> | <p>-70°C to +300°C</p> | <p>R22&R23 Hazard Level: HL1, HL2, HL3</p> |
|  <p>Revitex VSR10 EXPANDABLE VERSION RW</p> | <p>Expandable braided fiberglass sleeving impregnated with silicone varnish. Sleeving provides air space insultaion only.</p> | <p>Fiberglass and silicone</p> | <p>1:2,5</p> | <p>-70°C to +300°C</p> | <p>R22&R23 Hazard Level: HL1, HL2, HL3</p> |

EMI Shielding Sleeves

| Product | Description | Material | Temperature | Lightning Strike | Fire Behaviour EN 45545 |
|---|---|---|-----------------|------------------|---|
|  Emi Shield RW | Woven open sleeve. The material possesses unique wraparound qualities allowing easy cable bundling after wire harness assembly. The special construction provide lightning strike protection and high performance electromagnetic shielding; easy to make the electrical contact. | PPS monofilament and Tinned plated copper yarn | -65°C to +200°C | DNA | R22 & R23 Hazard Level: HL1, HL2, HL3 |
|  Emi Shield Pro RW | Woven open sleeve. The material possesses unique wraparound qualities allowing easy cable bundling after wire harness assembly. The special construction provide lightning strike protection and high performance electromagnetic shielding; easy to make the electrical contact. | PPS monofilament and 4% Nickel plated copper yarn | -65°C to +200°C | 10kA | DNA |
|  Dura Emi RW | Braided sleeving mainly meant for applications of electromagnetic and mechanical protection. | CuSn wires | -65°C to +260°C | DNA | DNA |



| Relats Products | EUROPEAN STANDARD | | | NAFTA STANDARD | | | | | | BRITISH STANDARD | | | GERMAN STANDARD | FRENCH STANDARD | | | |
|-----------------|-------------------|--------------|--------------|-------------------|------------------|---------------|-------------------|--------------|--------------|------------------|------------------------|---------------|-------------------|---------------------|------------------|---------------------|--------------|
| | C EN 45545* | | | NFPA 130 | | | | SMP 800-C | | Spread of flame | Reaction to fire | Smoke density | DIN 5510 | NF F 16.101 CLASS I | | NF F 16.101 CLASS F | |
| | Oxygen index | Gas toxicity | Heat release | Flame propagation | Fire propagation | Smoke release | Flame propagation | Gas toxicity | Heat release | | | | Burning behaviour | Oxygen index | Glow wire | Smoke density | Gas toxicity |
| | ISO 4589 | NF X 70.100 | ISO 5659 | ASTM E 162 | ASTM C 542 | ASTM E 662 | UL 1685 | SMP 800-C | ASTM E 1354 | EN ISO 11925-2 | BS EN ISO 11925-2:2002 | BS 6853:1999 | DIN 54837 | ISO 4589 | NF EN 60695-2-11 | NF X 10.702 | NF X 70.100 |
| PLAI7 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| PLAI7 AS | ✓ | | | | | | | | | | | | | ✓ | | | |
| NSG | ✓ | ✓ | ✓ | ✓ | | | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ |
| PS/PTG | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ |
| VSC | ✓ | ✓ | ✓ | ✓ | | ✓ | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ |
| FIRE PRO SC | ✓ | ✓ | ✓ | | | | | | | | | | | | | | |
| VSCTF | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ |
| VSR10/VRX10 | ✓ | ✓ | ✓ | | | ✓ | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| PLAS7 | | | | ✓ | | ✓ | | ✓ | ✓ | | | | | | | | |
| EMI SHIELD | ✓ | ✓ | ✓ | | | | | | | | | | | | | | |
| SLEEVE AF | ✓ | ✓ | ✓ | | | | | | | | | | | | | | |

* EN 45545 HL3 (maximum grade) certified: PLAI7, NSG, PS/PTG, VSC, VSR10/VRX10, VSCTF, EMI SHIELD and SLEEVE AF - Rev. 0516

Railway Customers



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Self Wrap

for bundling mechanical and electrical protection with water repellent treatment.

- Self Wrap 006 (EN6049-006); Self Wrap 006 Lite; Self Wrap HP 007 (EN6049-007); PLA17 V0 (ECS 0782)

Mechanical Protection Braids

multifilament braids for mechanical protection applications with water repellent treatment.

- DURANX (EN6049-003); DURANX Expandable (EN6049-004)

EMI Shielding Sleeves

nickel plated copper and PPS self closing sleeves for EMI protection applications inside or outside pressurized areas.

- EMI Shield Pro 4 (EN4674-003); EMI Shield Pro 27 (EN4674-004); EMI Shield Lite; PLAS EMI HP (Multifunctional); Dura Emi Pro; Dura Emi Lite

Glass Silicone Sleeves

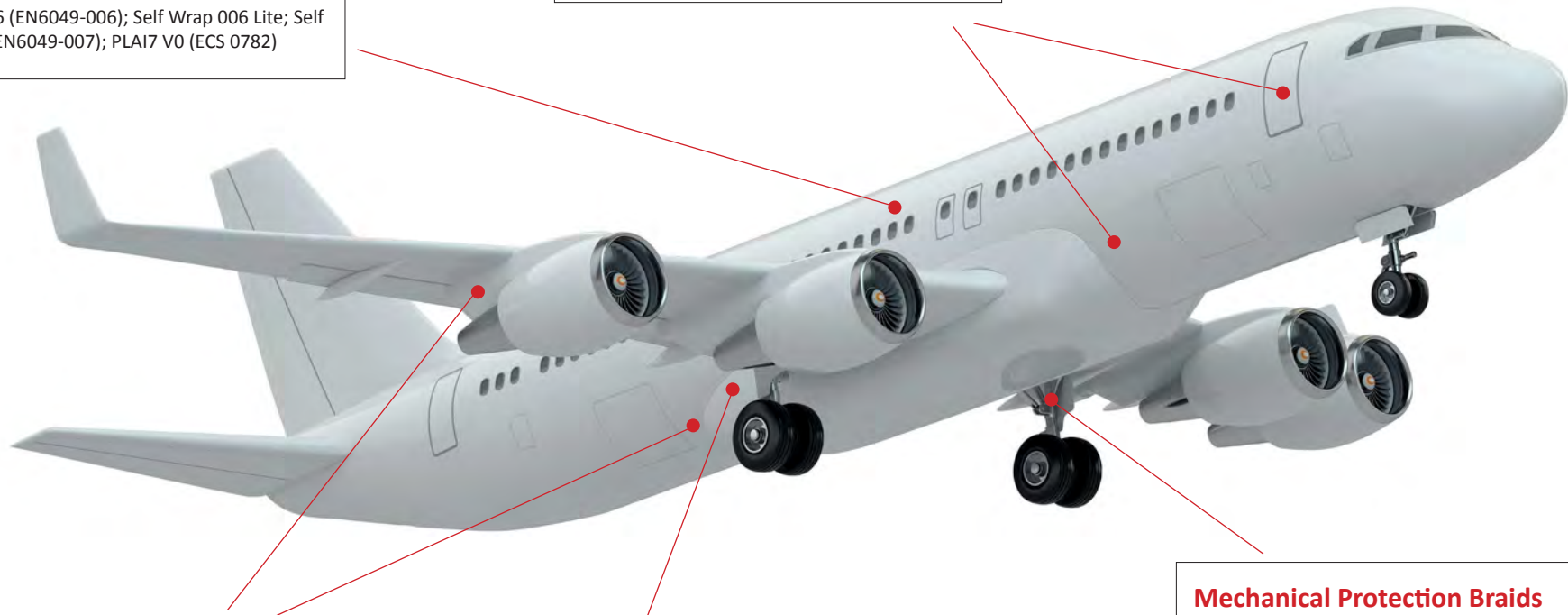
for fire protection of electrical cable and cable bundles to ensure the electrical characteristics will not be degraded.





- VSCTF Fire Pro; Fire Pro SC HP

Mechanical Protection Braids




















monofilament or multifilament braids (eg. PEEK, PPS and PFA) for mechanical protection applications (eg. hoses, fuel lines). Various expansion ratios available.

- Periflex PEEK; Periflex 200 HA; Periflex DURA PPS; Periflex PFA; Periflex HS




| Product | Description | Material | Temperature | Flammability | Smoke density | Toxicity |
|---|---|---|-----------------|-------------------------------------|-------------------------------------|-------------------------------------|
|  SELF WRAP 006 (EN6049-006) | Olive green woven open sleeve. The material possesses unique wraparound qualities allowing easy cable bundling after wire harness assembly. | PPS Monofilament and Meta-aramid Fiber | -70°C to +200°C | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
|  SELF WRAP LITE (ABS2413) | Olive green lightweight woven open sleeve. The material possesses unique wraparound qualities allowing easy cable bundling after wire harness assembly. | PPS monofilament and meta-aramid fiber | -70°C to +200°C | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
|  SELF WRAP HP 007 (EN6049-007) | Olive green woven open sleeve. The material possesses unique wraparound qualities allowing easy cable bundling after wire harness assembly. | PEEK Monofilament and Meta-aramid Fiber | -70°C to +260°C | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
|  PLAI7 V0 (ECS0782) | Black woven open sleeve. The material possesses unique wraparound qualities allowing easy cable bundling after wire harness assembly. | Monofilament and Multifilament Polyester Flame-retardant Fibers | -70°C to +150°C | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |



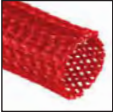





EMI Shielding Sleeves

| Product | Description | Material | Temperature | Flammability | Smoke Density | Toxicity | EMI Performance | Lightning Strike |
|---|---|--|-----------------|---|--|--|--|------------------|
|  EMI SHIELD PRO 4 / 27 (EN4674-003) (EN4674-004) | Woven open sleeve. The material possesses unique wraparound qualities allowing easy cable bundling after wire harness assembly. The special construction provide lightning strike protection and high performance electromagnetic shielding; easy to make the electrical contact. | PPS Monofilament and 4% Nickel plated copper yarn | -65°C to +200°C |  |  |  |  | 5kA |
| | | PPS Monofilament and 27% Nickel plated copper yarn | | | | | | 10kA |
|  EMI SHIELD LITE | Ultra light woven open sleeve. The material possesses unique wraparound qualities allowing easy cable bundling after wire harness assembly. The special construction provide lightning strike protection and high performance electromagnetic shielding. | PPS Monofilament and stainless steel cladding with Nickel-Copper | -65°C to +200°C |  |  |  |  | -- |
|  PLAS EMI HP (Multifunctional) (ABS2418) | Three layers woven open sleeve; all three layers are sewn together, easy to remove before making the connexions. The material possesses unique wraparound qualities allowing easy cable bundling after wire harness assembly. The special construction provide lightning strike protection and high performance electromagnetic shielding; easy to make the electrical contact. | External layer: Panox yarn and PEEK monofilament; Second layer: PPS monofilament and nickel cooper wire; Third layer: PTFE tape. | -65°C to +200°C |  |  |  |  | 10kA waveform 1 |
|  DURA EMI PRO | Braided sleeving composed of Cu Ni wires mainly meant for applications of electromagnetic and mechanical insulation. | Nickel plated copper wires | -65°C to +260°C |  | - | - | DNA | - |
|  DURA EMI LITE | Braided sleeving composed of stainless steel and CuNi wires mainly meant for applications of electromagnetic shielding and lightning strike protection. | Stainless steel cladding with nickel-copper | -80°C to +260°C |  | - | - | DNA | - |

Mechanical Protection Braids

| Product | Description | Material | Expansion Ratio | Temperature | Flammability | Smoke density | Toxicity |
|---|---|--------------------------|-----------------|------------------------|--|--|--|
|  <p>DURANX (EN6049-003)</p> | <p>Braided sleeving intended for mechanical protection and for the protection of cable bundles against flame. Extremely tough and light weight structure.</p> | <p>Meta-aramid Fiber</p> | <p>1:2</p> | <p>-70°C to +240°C</p> | <p><input checked="" type="checkbox"/></p> | <p><input checked="" type="checkbox"/></p> | <p><input checked="" type="checkbox"/></p> |
|  <p>DURANX EXPANDABLE (EN6049-004)</p> | <p>Expandable braided sleeving intended for mechanical protection and for the protection of cable bundles against flame. Extremely tough and light structure.</p> | <p>Meta-aramid Fiber</p> | <p>1:3</p> | <p>-70°C to +240°C</p> | <p><input checked="" type="checkbox"/></p> | <p><input checked="" type="checkbox"/></p> | <p><input checked="" type="checkbox"/></p> |

Mechanical Protection Braids

| Product | Description | Material | Expansion Ratio | Temperature | Flammability | Smoke density | Toxicity |
|---|---|---------------------------|-----------------|-----------------|---|---|---|
|  PERIFLEX PEEK | Braided sleeving mainly meant for applications of mechanical protection and thermal protection. Very tough and light weight structure. | PEEK Monofilament | 1:3 | -70°C to +260°C | Self-extinguishing | Under Test | Under Test |
|  PERIFLEX 200HA | Braided sleeving mainly meant for applications of mechanical protection and thermal protection. Very tough and light weight structure. | PEEK and PPS Monofilament | 1:2 | -70°C to +200°C | Self-extinguishing | Under Test | Under Test |
|  PERIFLEX HS (ABS0890) | Braided sleeving mainly meant for applications of mechanical protection and thermal protection. Excellent corrosion and chemical resistance | ECTFE monofilament | 1:1,6 | -70°C to +180°C | Self-extinguishing | Under Test | Under Test |
|  PERIFLEX DURA PPS | Braided sleeving intended for thermal and mechanical protection. Extremely tough and lightweight structure. | PPS Multifilament | 1:2 | -70°C to +200°C |  |  |  |
|  PERIFLEX PFA | Braided sleeving mainly meant for applications of mechanical protection and thermal protection. Very tough and light weight structure. | PFA Monofilament | 1:2 | -70°C to +260°C | Self-extinguishing | Under Test | Under Test |

Glass Silicone Sleeves

| Product | Description | Material | Temperature | Flammability | Smoke Density | Toxicity | Thermal Efficiency (SAE J2302) |
|--|---|---|-----------------|---|---|---|---|
|  VSCTF FIRE PRO | Braided / knitbraided sleeving coated with fire resistant special silicone rubber, that guarantees a high degree of thermal insulation and fire protection. | Fibreglass and special silicone rubber | -70°C to +235°C |  |  |  |  |
|  FIRE PRO SC HP | Self closing sleeving coated with self-extinguishing and fire resistant special coating, that guarantees a high degree of thermal insulation and fire protection. | Fiberglass and PPS monofilament and silicone rubber | 70°C to +235°C |  |  |  |  |

Aerospace Customers



Quality and Environmental Management



innovative covering solutions



Relats, S.A.

C.Priorat, 17. Pol. Ind. La Borda
08140 Caldes de Montbui
Barcelona. Catalonia. Spain
T +34 938 627 510
relatshq@relats.com

Relats Insulation Material (Suzhou) Co. Ltd

169 Meixin Road
Zhenze Town, Wujiang City 215231
Jiangsu Province. R.P. China
T +86 512 8155 7766
relatschina@relats.com

Relats México S.A. de CV

San Javier, 107. Puerto Interior
CP 36275 Silao
Guanajuato. México.
T +52 472 748 9100
relatsmexico@relats.com

Relats Maroc Sarl

Ilot D
Zone Franche d'Exportation de Tanger. Gzenaya
Route de Rabat à Tanger. Maroc
T +212 539 398 850
relatsmaroc@relats.com

Relats Japan Inc.

Tokyo Office

7F Nittoku Building
3-3-14 Shiba, Minato-ku
Tokyo 105-0014. Japan
T +81(0)3 6453 8310

Nagoya Office

Ark Sakae Nishiki New Business Building 306
3-11-25 Nishiki, Naka-ku, Nagoya-shi
Aichi-ken 460-0003 Japan
T +81 (0) 52 212 5250
relatsjapan@relats.com

Relats Vietnam Co. Ltd

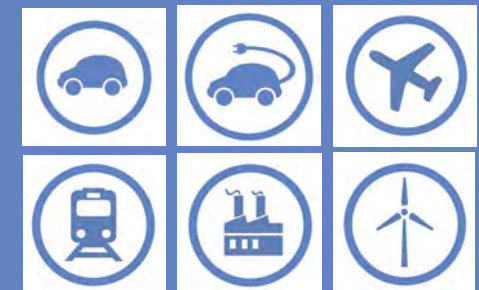
Lot 18, Dien Nam-Dien Ngoc Industrial Zone
Dien Ban Town,
Quang Nam Province.
Vietnam.
relatsvietnam@relats.com

Relats East Europe, SRL

Libertății street no. 21
Warehouse D, module 4
Apahida, Cluj 407035. Romania.
T +40 264 702 702
relatsromania@relats.com



Business Units:



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railway



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railway. innovative covering solutions

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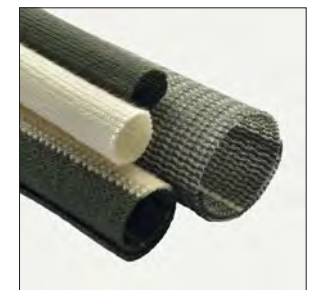
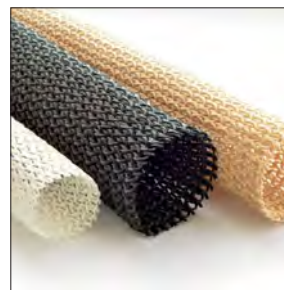
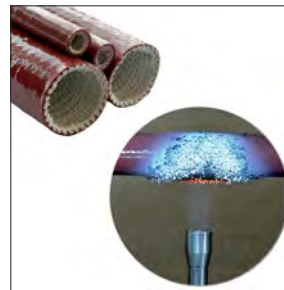
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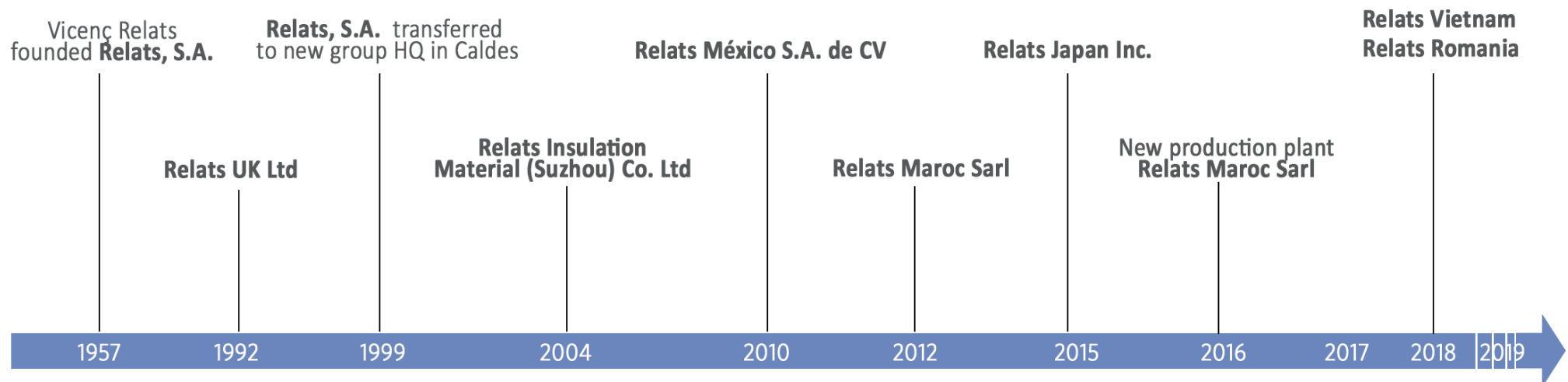
Leading manufacturer with global presence of:

- Electrical and thermal insulating sleeveings
- Mechanical protection and/or noise reduction covers (Self Closing TWS - PLAS family)
- EMI and heat reflective protective components
- Impact protection sleeves



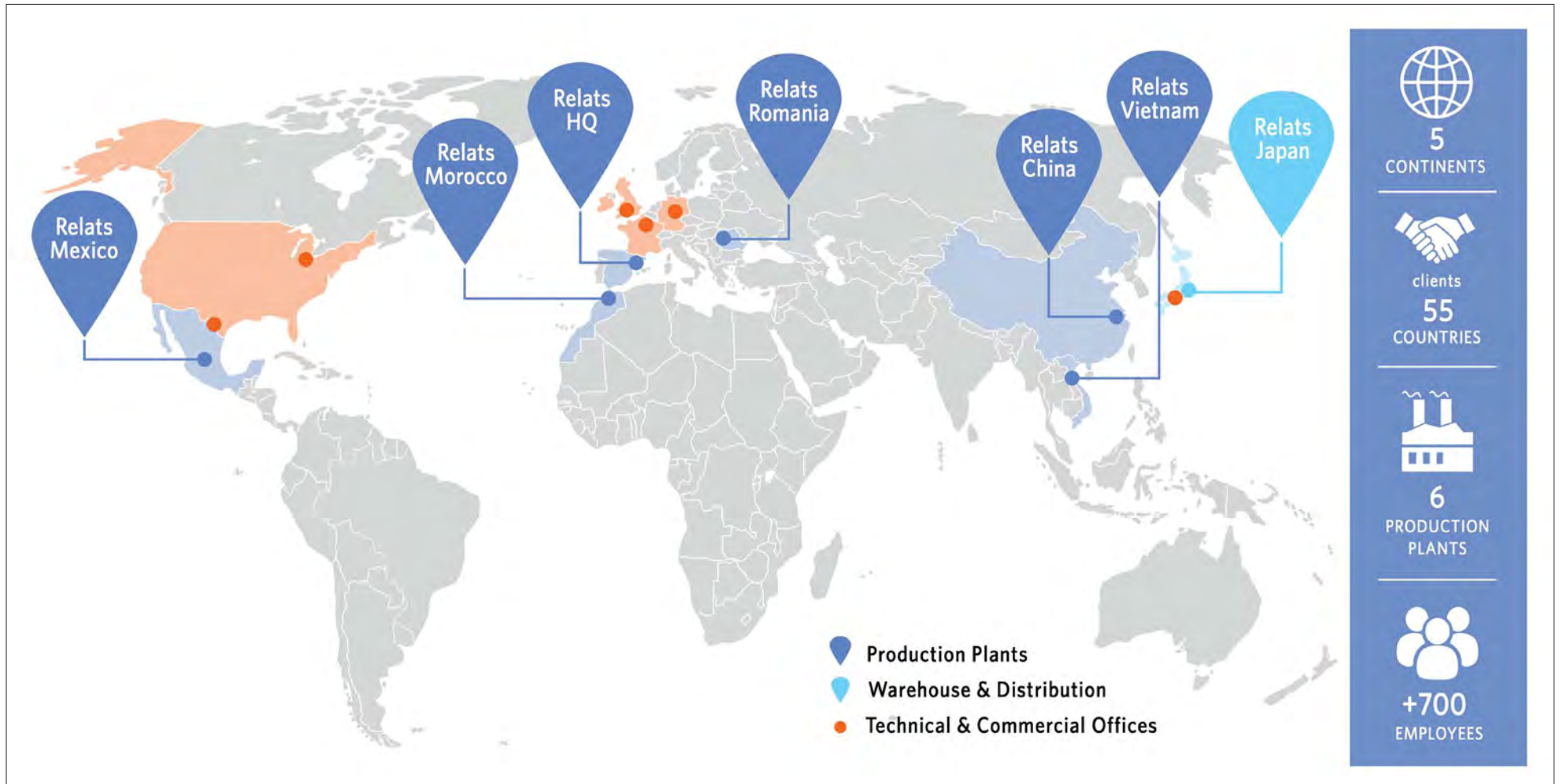


History & milestones





Worldwide presence:



Production Plants



Relats, S.A. - HQ

2016. Relats' headquarters is extended with a new smart warehouse

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| Building before expansion: | 7,300 m ² |
| Expansion: | 2,400 m ² |
| Total: | 9,700 m² |



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June, 2017 - Expansion

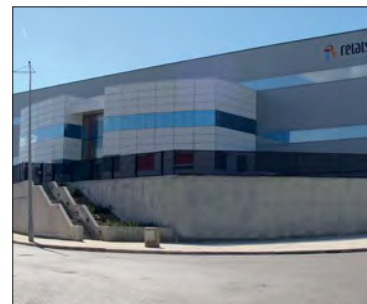
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| Before expansion: | 3,500 m ² |
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May, 2017 - Transfer to New Production Plant

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| Current Plant: | 4,500 m ² |
| New Plant: | 10,000 m² |



Relats Vietnam

June, 2018 - New Production Plant

Total: 7,250 m²



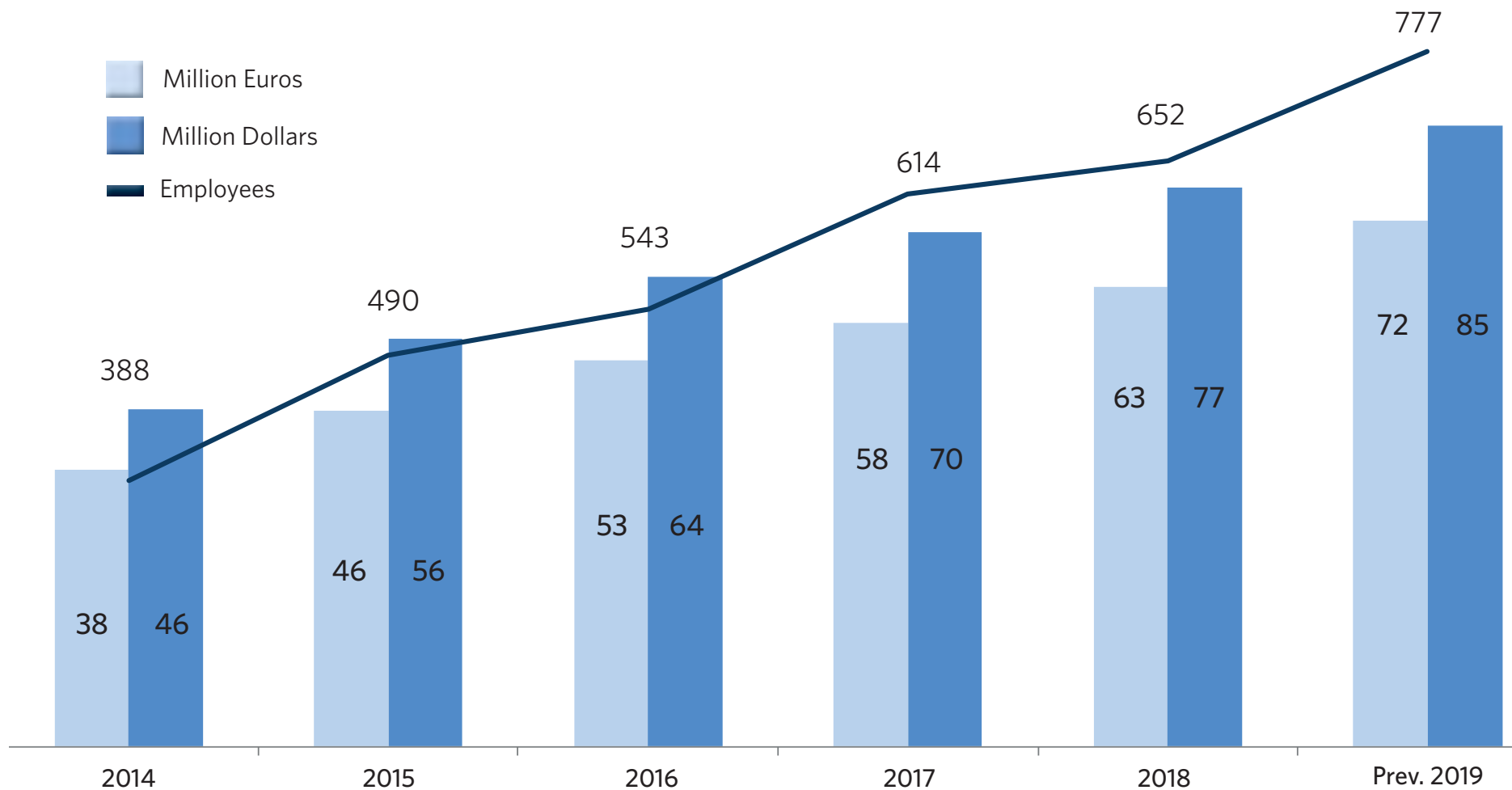
Relats Romania

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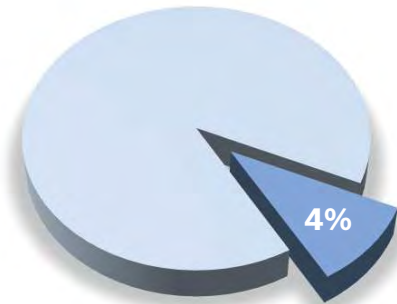


Turnover & Employees – Relats Group

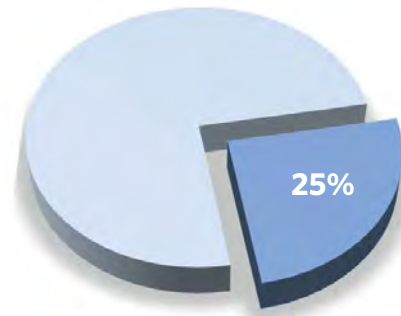


Constant innovation

R&D Investment vs Turnover
(annually)

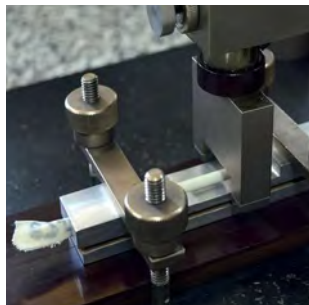


New Products vs Total Sales
(Products introduced in the market during last 4 years)



- 22 active patents, Avg. 2 new applications every year.
- Collaboration/agreements with technological centers, laboratories and universities.
- In regular consultation with European experts in our speciality.

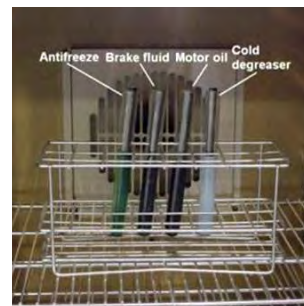
Laboratory capabilities in house



Mechanical tests



Thermal tests



Chemical tests



EMI testing



Physical testing



Crash tests

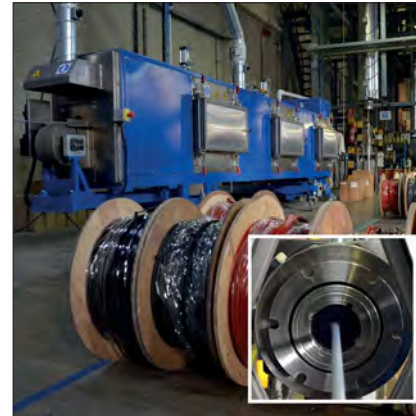
Production process



Braiding, knitting,
knitbraiding



Coating towers



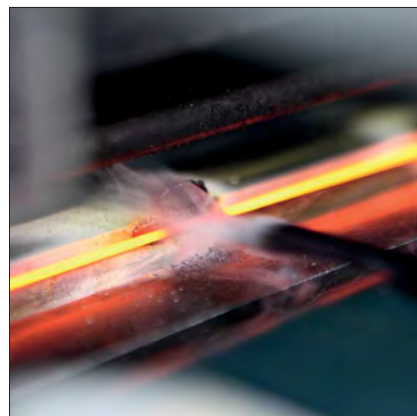
Silicone extrusion



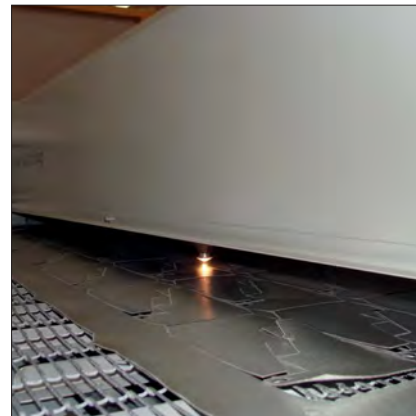
Alu foil laminating



Flat knitting self closing
sleeves



Cutting: Thermal,
mechanical, ultrasonic cut



Heatshields laser cutting



Artificial vision quality
system

Self Closing

for bundling and mechanical protection of harness cables.

- PLAI7 V0 RW; PLAI7 AS RW

Mechanical Protection Braids

Monofilament or Multifilament braids (eg. PET or PA6.6) for mechanical protection applications (eg. hoses, fuel lines). Various expansion ratios available.

- PS V0 RW; PS O RW; NSG RW

EMI Shielding Sleeves

Sleeves offering shielding of electromagnetic interference on high voltage cables.

- Emi Shield PRO RW; Emi Shield RW, Dura Emi RW

Reflective Sleeves

Open or closed aluminium foil laminated sleeves for thermal protection.

- Revitex Sleeve AF

Glass Silicone Sleeves

for high temperature applications for example engine sensors or fuel lines.

- VSC25/40/75 RW; VSC99 RW; VSCTE RW; VSCTF RW; FIRE PRO SC RW

Glass Impregnated Sleeves

High oxygen index impregnated sleeves to provide insulation at high temperatures.

- VSR10 RW; VSR10 Expandable Version RW

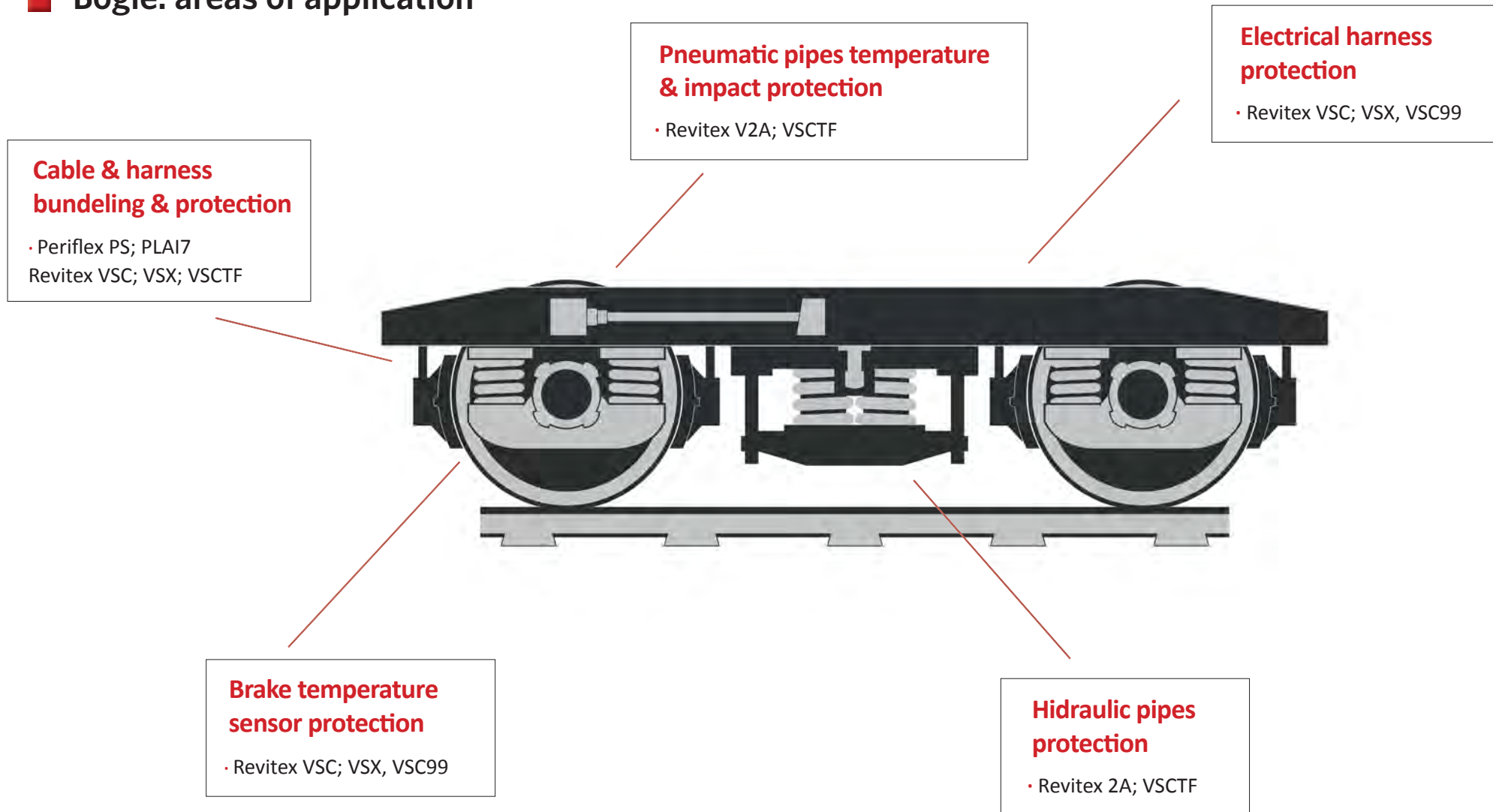
Heatshields





Aluminium foil laminated material customized heatshields for thermal protection, for example connectors or valves.

- Heatshield


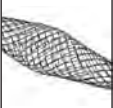



■ Bogie: areas of application




| Product | Description | Material | Temperature | Abrasion | Fire Behaviour EN 45545 |
|--|--|--|------------------------|---|---|
|  <p>PLAI7 V0 RW</p> | <p>Woven open sleeve made of flame-retardant fibers with unique wraparound qualities allowing easy cable bundling after wire harness assembly.</p> | <p>Monofilament and Multifilament Polyester</p> | <p>-70°C to +150°C</p> |  | <p>R22&R23 Hazard Level HL1, HL2, HL3</p> |
|  <p>PLAI7 AS RW</p> | <p>Woven open sleeve made of flame-retardant fibers and aluminium foil inside with unique wraparound qualities allowing easy cable bundling after wire harness assembly.</p> | <p>Monofilament and Multifilament Polyester and aluminium foil</p> | <p>-70°C to +150°C</p> |  | <p>R22&R23 Hazard Level HL1, HL2, HL3</p> |

Mechanical Protection Braids


| Product | Description | Material | Expansion ratio | Temperature | Abrasion | Fire Behaviour EN 45545 |
|---|--|------------------------|-----------------|-----------------|-----------|---|
|  Periflex PS V0 RW | Expandable braided sleeving made of flame retardant fibers mainly meant for applications of mechanical protection. | Monofilament Polyester | 1:2 | -70°C to +150°C | ■ ■ ■ □ □ | R22&R23 Hazard Level: HL1, HL2, HL3 |
|  Periflex PS O RW | Highly expandable braided sleeving mainly meant for allowing easy cable bundling after wire and harness assembly. | Monofilament Polyester | 1:3,6 | -70°C to +150°C | ■ □ □ □ □ | R22&R23 Hazard Level: HL1, HL2, HL3 |
|  Periflex NSG RW | Expandable braided sleeving mainly meant for applications of mechanical protection. | Monofilament Polyamide | 1:2 | -70°C to +150°C | ■ ■ ■ ■ ■ | R22 Hazard Level: HL1, HL2 R23 Hazard Level: HL1, HL2, HL3 |

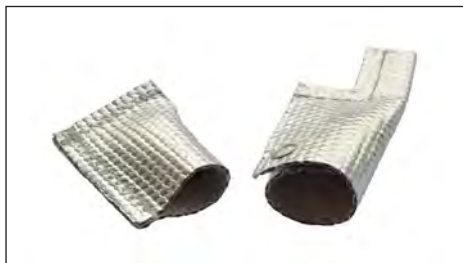
Reflective Sleeves





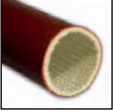


| Product | Description | Material | Temperature | Thermal Efficiency (SAE J2302) | Fire Behaviour EN 45545 |
|---|--|-------------------------------|-----------------|--------------------------------|-------------------------|
|  Revitex Sleeve AF | Braided sleeving with aluminium foil which refracts radiation heat and provides excellent insulating properties. | Fibreglass and Aluminium Foil | -70°C to +200°C | ■ ■ ■ ■ □ | Self-extinguishing |

Heatshields


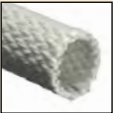
| Product | Description | Material | Temperature | Thermal Efficiency (SAE J2302) | Fire Behaviour EN 45545 |
|---|---|-------------------------------|-----------------|--------------------------------|-------------------------|
|  Revitex End Fit V AF (Heatshield) | Customized heatshields made of fibreglass substrate laminated with aluminium foil. Various types of substrates are available. Heatshields can be with button snaps, adhesive tapes (partial or full covering) and sown with glass or aramide yarns. Product designed for thermal protection of connectors and other components. | Fibreglass and Aluminium Foil | -70°C to +200°C | ■ ■ ■ ■ □ | Self-extinguishing |
| | | | -70°C to +250°C | | |
| | | | -70°C to +300°C | | |






Glass Silicone Sleeves

| Product | Description | Material | Temperature | Fire Behaviour EN 45545 |
|--|--|---|-----------------|--|
|  Revitex VSC25/40/75 RW | Sleeving made of a special silicone rubber coated fiberglass braid. This is a Class 200 electrical insulating sleeving available in three voltage grades. | Fiberglass and silicone | -70°C to +235°C | R22&R23 Hazard Level: HL1, HL2, HL3 |
|  Revitex VSC99 RW | Sleeving made of a special silicone rubber thick coated fiberglass braid that guarantees a high dielectric strength. | Fiberglass and silicone | -70°C to +235°C | DNA |
|  Revitex VSCTE RW | Fiberglass sleeving, thick wall, coated with self extinguishing silicone rubber, that guarantees a high degree of thermal insulation. | Fiberglass and silicone | -70°C to +235°C | DNA |
|  Revitex VSCTF RW | Fiberglass knitbraided sleeving, thick wall, coated with self extinguishing and fire resistant silicone rubber, that guarantees a high degree of thermal insulation and fire protection. | Fiberglass and fire resistant silicone | -70°C to +235°C | R22 Hazard Level: HL1, HL2 R23 Hazard Level: HL1, HL2 HL3 |
|  FIRE PRO SC RW | Self closing fiberglass and polyester sleeving coated with self-extinguishing and fire resistant special silicone rubber, that guarantees a high degree of thermal insulation and fire protection. | Fiberglass, polyester and fire resistant silicone | -70°C to +200°C | R22 Hazard Level: HL1, HL2 R23 Hazard Level: HL1, HL2 |

Glass Impregnated Sleeves

| Product | Description | Material | Expansion ratio | Temperature | Fire Behaviour EN 45545 |
|--|---|--------------------------------|-----------------|------------------------|--|
|  <p>Revitex VSR10 RW</p> | <p>Braided fiberglass sleeving impregnated with silicone varnish. Sleeving provides air space insultaion only.</p> | <p>Fiberglass and silicone</p> | <p>--</p> | <p>-70°C to +300°C</p> | <p>R22&R23 Hazard Level: HL1, HL2, HL3</p> |
|  <p>Revitex VSR10 EXPANDABLE VERSION RW</p> | <p>Expandable braided fiberglass sleeving impregnated with silicone varnish. Sleeving provides air space insultaion only.</p> | <p>Fiberglass and silicone</p> | <p>1:2,5</p> | <p>-70°C to +300°C</p> | <p>R22&R23 Hazard Level: HL1, HL2, HL3</p> |

EMI Shielding Sleeves

| Product | Description | Material | Temperature | Lightning Strike | Fire Behaviour EN 45545 |
|---|---|--|------------------------|------------------|--|
|  Emi Shield RW | <p>Woven open sleeve. The material possesses unique wraparound qualities allowing easy cable bundling after wire harness assembly. The special construction provides lightning strike protection and high performance electromagnetic shielding; easy to make the electrical contact.</p> | <p>PPS monofilament and Tinned plated copper yarn</p> | <p>-65°C to +200°C</p> | <p>DNA</p> | <p>R22 & R23 Hazard Level: HL1, HL2, HL3</p> |
|  Emi Shield Pro RW | <p>Woven open sleeve. The material possesses unique wraparound qualities allowing easy cable bundling after wire harness assembly. The special construction provides lightning strike protection and high performance electromagnetic shielding; easy to make the electrical contact.</p> | <p>PPS monofilament and 4% Nickel plated copper yarn</p> | <p>-65°C to +200°C</p> | <p>10kA</p> | <p>DNA</p> |
|  Dura Emi RW | <p>Braided sleeving mainly meant for applications of electromagnetic and mechanical protection.</p> | <p>CuSn wires</p> | <p>-65°C to +260°C</p> | <p>DNA</p> | <p>DNA</p> |



| Relats Products | EUROPEAN STANDARD | | | NAFTA STANDARD | | | | | | BRITISH STANDARD | | | GERMAN STANDARD | FRENCH STANDARD | | | |
|-----------------|-------------------|--------------|--------------|-------------------|------------------|---------------|-------------------|--------------|--------------|------------------|------------------------|---------------|-------------------|---------------------|------------------|---------------------|--------------|
| | C EN 45545* | | | NFPA 130 | | | | SMP 800-C | | Spread of flame | Reaction to fire | Smoke density | DIN 5510 | NF F 16:101 CLASS I | | NF F 16:101 CLASS F | |
| | Oxygen index | Gas toxicity | Heat release | Flame propagation | Fire propagation | Smoke release | Flame propagation | Gas toxicity | Heat release | | | | Burning behaviour | Oxygen index | Glow wire | Smoke density | Gas toxicity |
| | ISO 4589 | NF X 70.100 | ISO 5659 | ASTM E 162 | ASTM C 542 | ASTM E 662 | UL 1685 | SMP 800-C | ASTM E 1354 | EN ISO 11925-2 | BS EN ISO 11925-2:2002 | BS 6853:1999 | DIN 54837 | ISO 4589 | NF EN 60695-2-11 | NF X 10.702 | NF X 70.100 |
| PLAI7 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| PLAI7 AS | ✓ | | | | | | | | | | | | | ✓ | | | |
| NSG | ✓ | ✓ | ✓ | ✓ | | | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ |
| PS/PTG | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ |
| VSC | ✓ | ✓ | ✓ | ✓ | | ✓ | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ |
| FIRE PRO SC | ✓ | ✓ | ✓ | | | | | | | | | | | | | | |
| VSCTF | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ |
| VSR10/VRX10 | ✓ | ✓ | ✓ | | | ✓ | | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| PLAS7 | | | | ✓ | | ✓ | | ✓ | ✓ | | | | | | | | |
| EMI SHIELD | ✓ | ✓ | ✓ | | | | | | | | | | | | | | |
| SLEEVE AF | ✓ | ✓ | ✓ | | | | | | | | | | | | | | |

* EN 45545 HL3 (maximum grade) certified: PLAI7, NSG, PS/PTG, VSC, VSR10/VRX10, VSCTF, EMI SHIELD and SLEEVE AF - Rev. 0516

Railway Customers



BOMBARDIER
the evolution of mobility



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STADLER
Cleverer Lösungen auf der Schiene



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Quality and Environmental Management



railway. innovative covering solutions

Relats, S.A.

C.Priorat, 17. Pol. Ind. La Borda
08140 Caldes de Montbui
Barcelona. Catalonia. Spain
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169 Meixin Road
Zhenze Town, Wujiang City 215231
Jiangsu Province. R.P. China
T +86 512 8155 7766
relatschina@relats.com

Relats México S.A. de CV

San Javier, 107. Puerto Interior
CP 36275 Silao
Guanajuato. México.
T +52 472 748 9100
relatsmexico@relats.com

Relats Maroc Sarl

Ilot D
Zone Franche d'Exportation de Tanger. Gzenaya
Route de Rabat à Tanger. Maroc
T +212 539 398 850
relatsmaroc@relats.com

Relats Japan Inc.

Tokyo Office

7F Nittoku Building
3-3-14 Shiba, Minato-ku
Tokyo 105-0014. Japan
T +81(0)3 6453 8310

Nagoya Office

Ark Sakae Nishiki New Business Building 306
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Relats Vietnam Co. Ltd

Lot 18, Dien Nam-Dien Ngoc Industrial Zone
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Libertății street no. 21
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industrial & energy



innovative covering solutions





industrial & energy. innovative covering solutions

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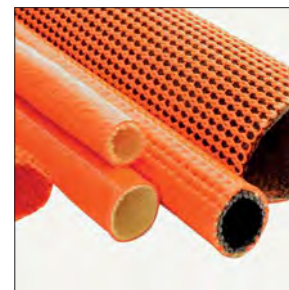
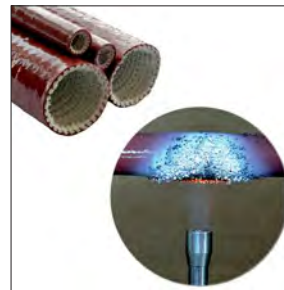


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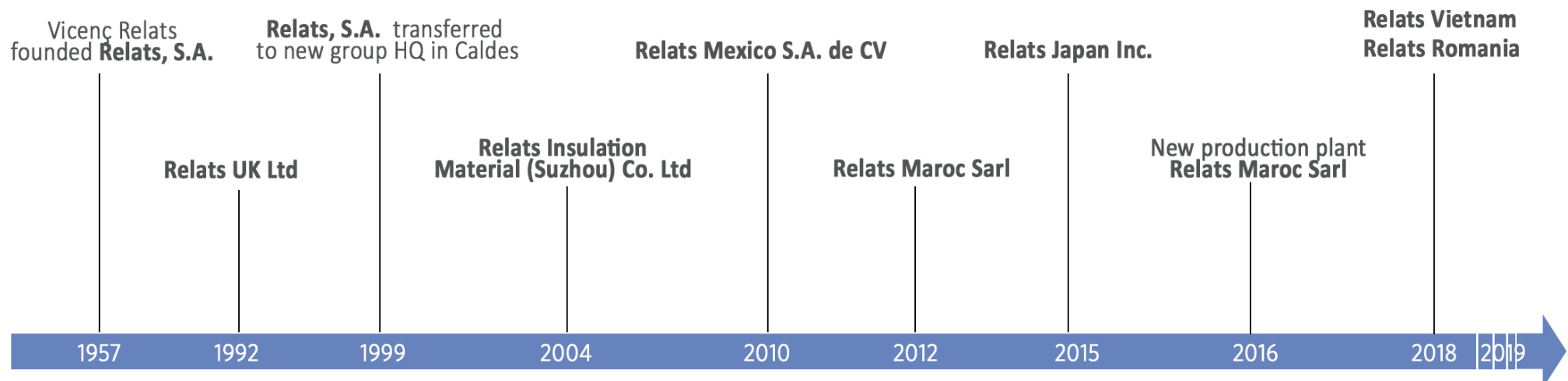
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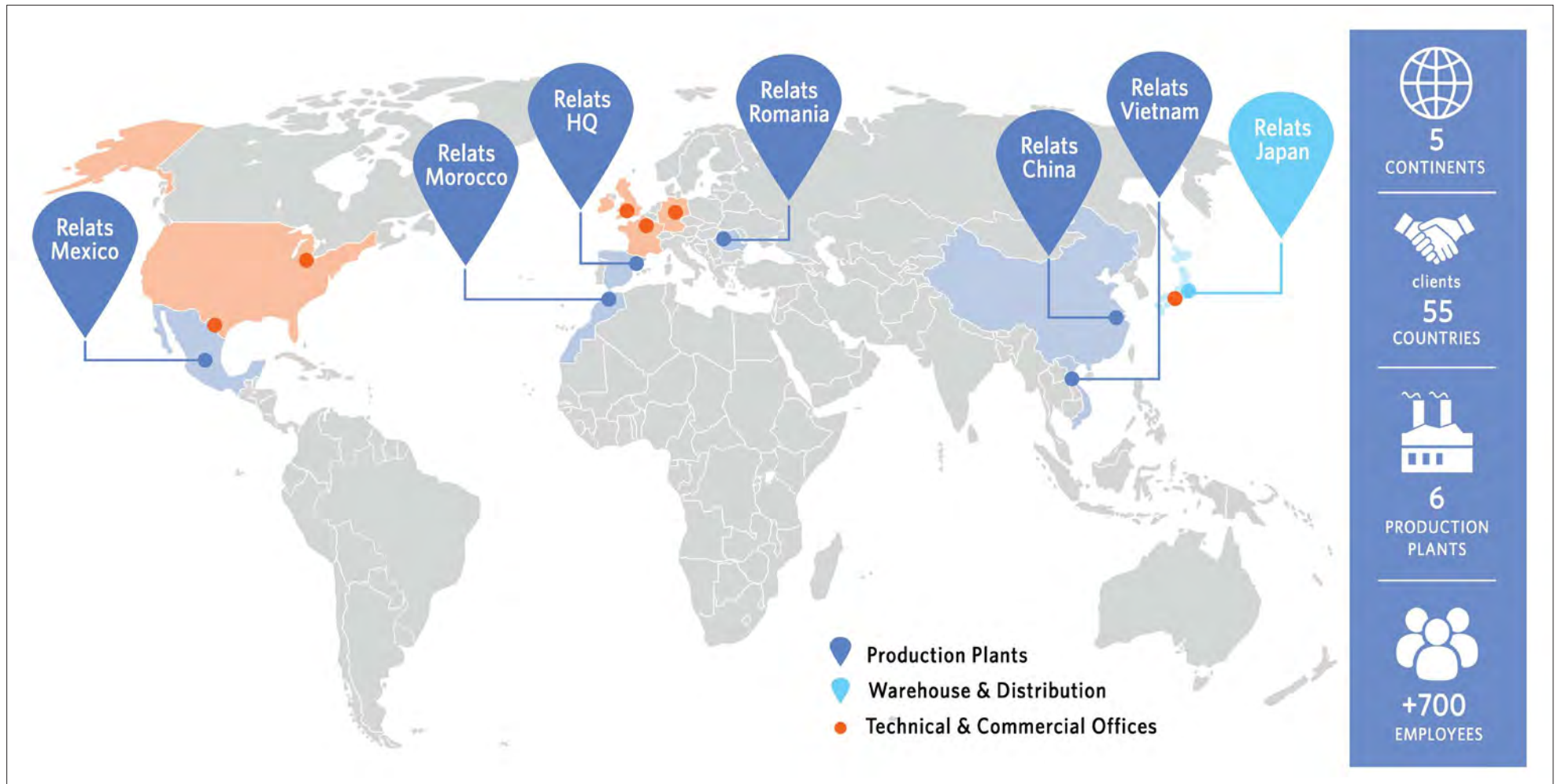


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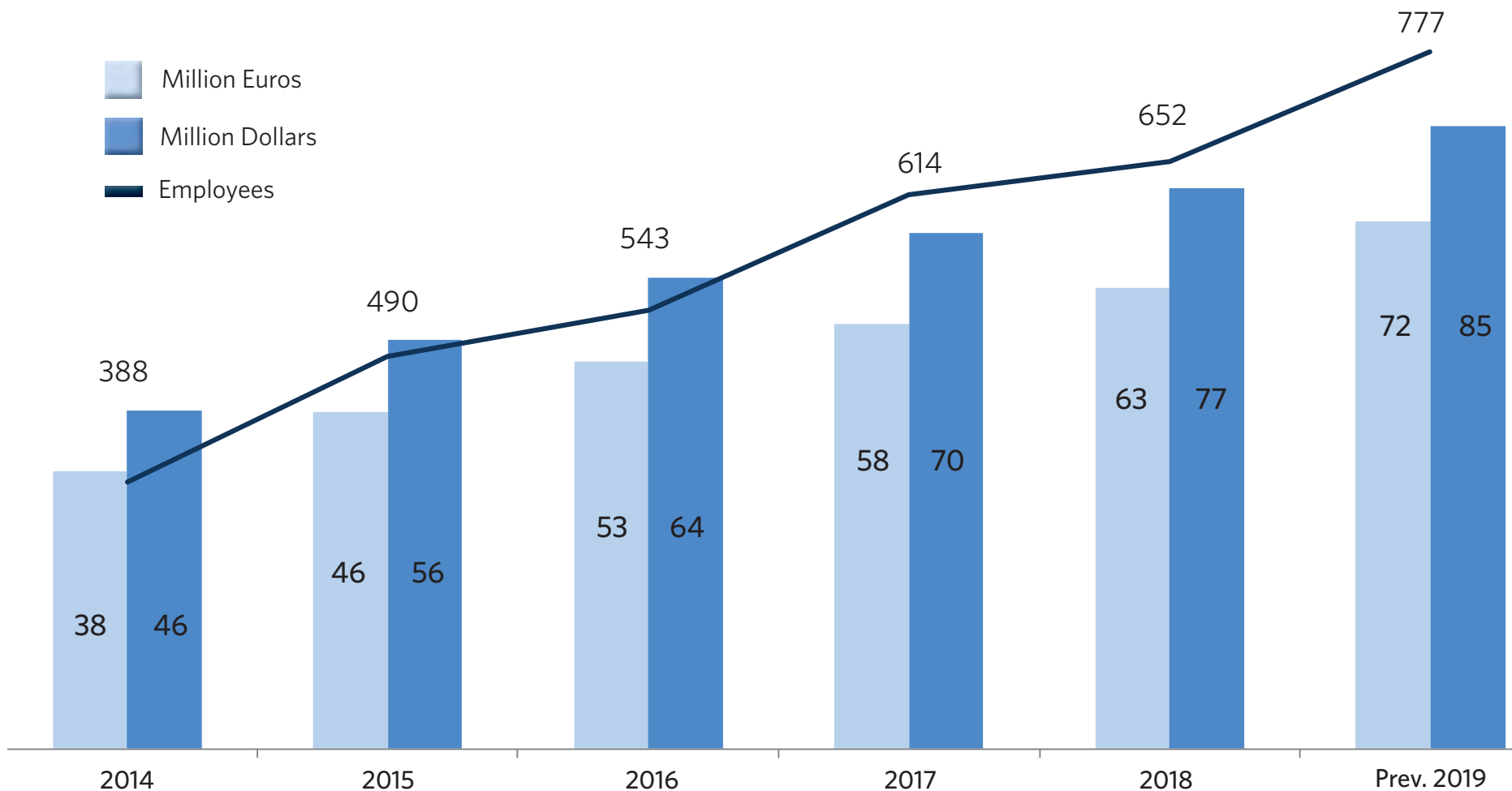
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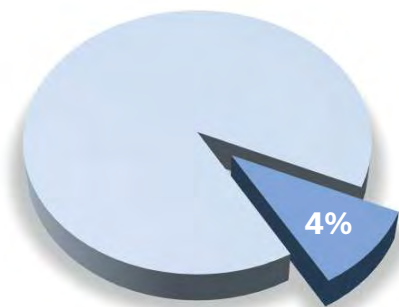


Turnover & Employees – Relats Group

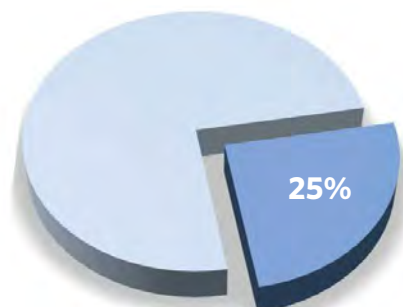


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Laboratory capabilities in house



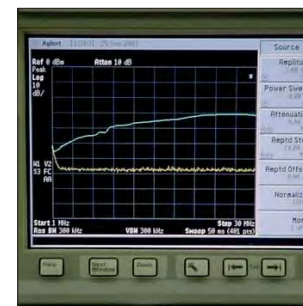
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Physical testing



Crash tests

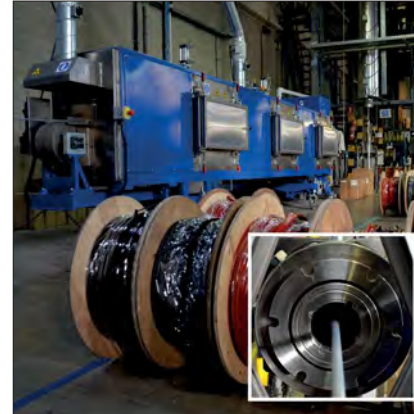
Production process



Braiding, knitting,
knitbraiding



Coating towers



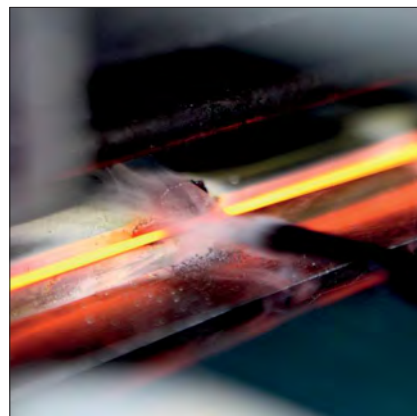
Silicone extrusion



Alu foil laminating



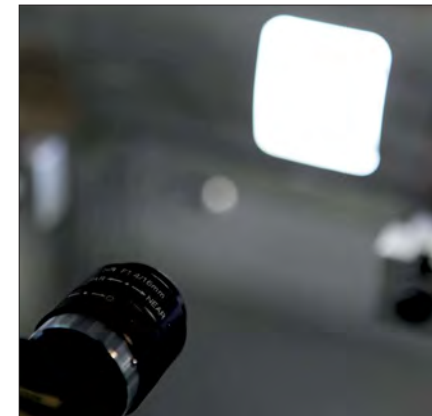
Flat knitting self closing
sleeves



Cutting: Thermal,
mechanical, ultrasonic cut

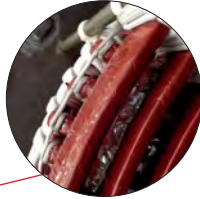


Heatshields laser cutting



Artificial vision quality
system

Windmill Industry



Glass Silicone Sleeves

For electrical insulation applications.

- Revitex VSC25/VSC75/VSX40/VSX75/VSC99

For electrical and mechanical insulation applications

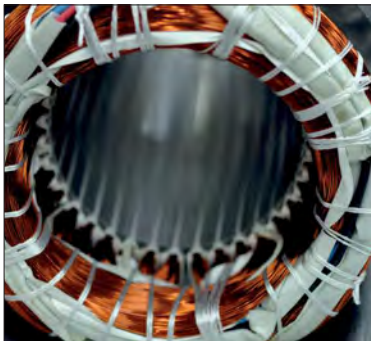
- Revitex V2A

Glass & Polyester Cords

For electrical machines armature banding.

- Revitex Therm Support Cord; Revitex V0000

EV, HEV & PHEV Motors



Silicone Sleeves & Tie Cords

Sleeves for electrical insulation of EV, HEV & PHEV motors and Tie Cord to tie the winding due to its mechanical resistance and high compatibility with the resins used in motors.

- Revitex V2V / Revitex Silcup; Tie Cord

Steel Industry



Glass Silicone Sleeves

Open and closed sleeves for fire protection of electrical cable and cable bundles to ensure the electrical characteristics will not be degraded.

- VSCTF Fire Pro; Fire Pro SC HP

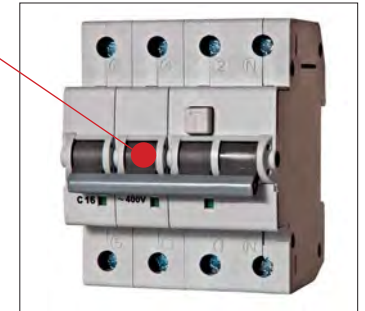
Circuit Breakers



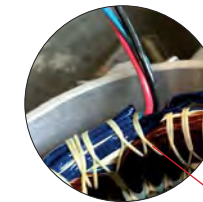
Glass Acrylic Sleeves

For isolation of thermal bimetals, heat conductors. Mainly used on motor protection switches, automatic circuit breakers.

- Revitex Bimetal Cover



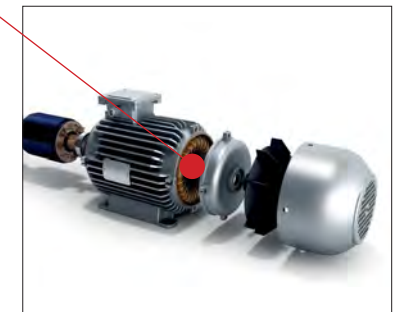
Electrical Power Units






Glass Acrylic & Polyurethane Sleeves

For protection of electrical connections and thermals because of its compatibility with impregnating varnishes.


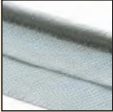


- Revitex VPG40 / VPG80; Revitex VAC30 / VAC40 / VAC80



Mechanical Protection Braids


| Product | Description | Material | Expansion ratio | Temperature | Flammability |
|--|--|-------------------------|-----------------|-----------------|--------------------|
|  Periflex PS V0 | Expandable braided sleeving mainly meant for applications of mechanical protection. | Monofilament Polyester | 1:2 | -70°C to +150°C | UL94 V0 |
|  Periflex PO V0 | Highly expandable braided sleeving mainly meant for applications of mechanical protection. | Monofilament Polyester | 1:3 | -70°C to +150°C | UL94 V0 |
|  Periflex Dura HA | Flexible sleeving intended for high mechanical protection. Due to its dense woven construction provides 100% coverage. | Multifilament Polyamide | -- | -70°C to +125°C | Self-Extinguishing |

Glass & Polyester Cords



| Product | Description | Material | Temperature | Flammability |
|--|--|--------------------------|-----------------|--------------------|
|  Revitex Therm Support Cord | Sleeving made of a bundle of E-glass yarn with a braided polyester yarn covering. | Fiberglass and Polyester | -70°C to +180°C | DNA |
|  Revitex Therm Tape Cord | Sleeving made of woven fiberglass tape and fully encapsulated knitbraided fiberglass yarn filled with textured fiberglass threads. | Fiberglass | -70°C to +600°C | Self-Extinguishing |
|  Polyester Sleeve Bopu | Expandable braided sleeving with coverage almost 100%. | Multifilament Polyester | -70°C to +150°C | Self-Extinguishing |
|  Revitex V0000 | Heat treated braided sleeving. Sleeving provides air space insulating only. | Fiberglass | -70°C to +550°C | Incombustible |

Gaskets




| Product | Description | Material | Temperature | Flammability |
|---|--|--|-----------------|--------------|
|  Revitex Therm | Braided or knitbraided fibreglass yarn, impregnated or not, unfilled or filled with textured fibreglass yarn or stainless steel metal mesh and optionally with paper backed adhesive tape. | Fiberglass, Stainless Steel, Paper Backed Adhesive | -70°C to +600°C | Fire Proof |

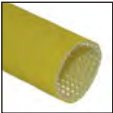



Polyester Impregnated Sleeves

| Product | Description | Material | Temperature | Flammability | Abrasion |
|---|--|----------------------------|-----------------|--------------|---|
|  Polycryl PAC | Braided polyester sleeving impregnated with acrylic varnish. This is a Class B electrical insulating sleeving available in two voltage grades. | Polyester yarn and Acrylic | -70°C to +180°C | DNA |  |



Glass Impregnated Sleeves

| Product | Description | Material | Temperature | Flammability | UL |
|---|---|-------------------------|-----------------|---------------|---------------|
|  Revitex VSR10 | Braided fiberglass sleeving impregnated with silicone varnish. Sleeving provides air space insulation only. | Fiberglass and silicone | -70°C to +300°C | Incombustible | UL recognized |





Glass Acrylic Sleeves

| Product | Description | Material | Temperature | Flammability | UL |
|---|--|---------------------------------------|-----------------|--------------------------------|---------------|
|  Revitex VAC30 | Braided fiberglass sleeving coated with acrylic resin. This is a Class F electrical insulating sleeving. | Fiberglass and Acrylic | -70°C to +155°C | Extinguishes within 60 sec. VW | -- |
|  Revitex VAC40 | Braided fiberglass impregnated sleeving coated with acrylic resin. This is a Class F electrical insulating sleeving. | Fiberglass and Acrylic | -70°C to +155°C | Extinguishes within 60 sec. VW | UL recognized |
|  Revitex VAC80 | Braided fiberglass impregnated sleeving coated with acrylic resin. This is a Class F electrical insulating sleeving. | Fiberglass and Acrylic | -70°C to +155°C | Extinguishes within 60 sec. VW | UL recognized |
|  Revitex Bimetal Cover | Flat or Round Fiberglass braid which is usually treated with an inorganic impregnation. | Fiberglass and Inorganic Impregnation | -70°C to +300°C | Self-Extinguishing | -- |

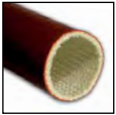




Silicone, Acrylic & Polyurethane Sleeves







| Product | Description | Material | Temperature | Flammability | UL |
|--|--|--|------------------------|---------------------------|----------------------|
|  <p>Revitex GUF VPG 40/80</p> | <p>Braided fiberglass sleeving coated with polyurethane varnish.</p> | <p>Fiberglass and Polyurethane</p> | <p>-70°C to +155°C</p> | <p>HS</p> | <p>UL recognized</p> |
|  <p>Revitex V2A 25</p> | <p>Sleeving made of fiberglass braid coated with silicone rubber as a first internal layer. As second external layer made of a braided polyester sleeving with acrylic impregnation.</p> | <p>Fiberglass, Polyester, Silicone and Acrylic</p> | <p>-70°C to +155°C</p> | <p>Self-Extinguishing</p> | <p>--</p> |

Glass Silicone Sleeves

| Product | Description | Material | Expansion Ratio | Temperature | Flammability | UL |
|--|---|-------------------------|-----------------|-----------------|--------------------|---------------|
|  Revitex VSC25/75 | Sleeving made of a special silicone rubber coated fiberglass braid. | Fiberglass and silicone | -- | -70°C to +235°C | Self-Extinguishing | UL recognized |
|  Revitex VSX40 | Sleeving made of a special silicone rubber, its unique construction allows expanding 1.6 times its original size. | Fiberglass and silicone | 1: 1,6 | -70°C to +235°C | Self-Extinguishing | -- |
|  Revitex VSX75 | Sleeving made of a special silicone rubber coated fiberglass braid, with allows to expand it to the double of its original size | Fiberglass and silicone | 1:2 | -70°C to +235°C | Self-Extinguishing | UL recognized |
|  Revitex VSC99 | Sleeving made of a special silicone rubber thick coated fiberglass braid that guarantees a high dielectric strength | Fiberglass and silicone | -- | -70°C to +235°C | Self-Extinguishing | -- |

Glass Silicone Sleeves

| Product | Description | Material | Temperature | Flammability |
|--|--|---|-----------------|--------------------|
|  Revitex VSCTE | Fiberglass sleeving, thick wall, coated with self extinguishing silicone rubber, that guarantees a high degree of thermal insulation | Fiberglass and silicone | -70°C to +235°C | Self-Extinguishing |
|  Revitex VSCTF | Fiberglass knitbraided sleeving, thick wall, coated with self extinguishing and fire resistant silicone rubber, that guarantees a high degree of thermal insulation and fire protection. | Fiberglass and fire resistant silicone | -70°C to +235°C | Self-Extinguishing |
|  FIRE PRO SC | Self closing fiberglass and polyester sleeving coated with self-extinguishing and fire resistant special silicone rubber, that guarantees a high degree of thermal insulation and fire protection. | Fiberglass, polyester and fire resistant silicone | -70°C to +200°C | Self-Extinguishing |
|  Revitex Silcup | Sleeving made of a special silicone rubber coated fiberglass braid with one end bonded with silicone. | Fiberglass and silicone | -70°C to +235°C | Self-Extinguishing |
|  Revitex V2V | Sleeving made of fiberglass braid coated with silicone rubber as a first internal layer. As second external layer made of a braided fiberglass sleeving with silicone impregnation. | Fiberglass and silicone | -70°C to +200°C | Self-Extinguishing |

| Product | Description | Material | Temperature | Flammability | Tensile Strength | ATF Oil Compatibility |
|---|---|------------------|-----------------|--------------------|---|--------------------------------|
|  <p>Tie Cord Nomex®</p> | Braided sleeving made of Nomex® for tie motors, intended for mechanical resistance and high compatibility with resins. | Nomex® yarn | -70°C to +180°C | Self-Extinguishing |  | Tensile Strength Retention 70% |
|  <p>Tie Cord PPS</p> | Braided sleeving made of PPS for tie motors, intended for mechanical resistance and high compatibility with resins. | PPS yarn | -70°C to +180°C | Self-Extinguishing |  | Tensile Strength Retention 70% |
|  <p>Tie Cord Para-aramid</p> | Braided sleeving made of Para-aramid for tie motors, intended for mechanical resistance and high compatibility with resins. | Para-aramid yarn | -70°C to +180°C | Self-Extinguishing |  | Tensile Strength Retention 70% |

Industrial and Energy Customers

SIEMENS



B/S/H/



Quality and Environmental Management



industrial & energy. innovative covering solutions



Relats, S.A.

C.Priorat, 17. Pol. Ind. La Borda
08140 Caldes de Montbui
Barcelona. Catalonia. Spain
T +34 938 627 510
relatshq@relats.com

Relats Insulation Material (Suzhou) Co. Ltd

169 Meixin Road
Zhenze Town, Wujiang City 215231
Jiangsu Province. R.P. China
T +86 512 8155 7766
relatschina@relats.com

Relats México S.A. de CV

San Javier, 107. Puerto Interior
CP 36275 Silao
Guanajuato. México.
T +52 472 748 9100
relatsmexico@relats.com

Relats Maroc Sarl

Ilot D
Zone Franche d'Exportation de Tanger. Gzenaya
Route de Rabat à Tanger. Maroc
T +212 539 398 850
relatsmaroc@relats.com

Relats Japan Inc.

Tokyo Office

7F Nittoku Building
3-3-14 Shiba, Minato-ku
Tokyo 105-0014. Japan
T +81(0)3 6453 8310

Nagoya Office

Ark Sakae Nishiki New Business Building 306
3-11-25 Nishiki, Naka-ku, Nagoya-shi
Aichi-ken 460-0003 Japan
T +81 (0) 52 212 5250
relatsjapan@relats.com

Relats Vietnam Co. Ltd

Lot 18, Dien Nam-Dien Ngoc Industrial Zone
Dien Ban Town,
Quang Nam Province.
Vietnam.
relatsvietnam@relats.com

Relats East Europe, SRL

Libertății street no. 21
Warehouse D, module 4
Apahida, Cluj 407035. Romania.
T +40 264 702 702
relatsromania@relats.com



Business Units:



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Relats products

PowerGen

Relats product: VSC__TS

DESCRIPTION:

Sleeving made of a special silicone rubber coated fiberglass braid with one end bonded with silicone. This is a Class 200 electrical insulating sleeving.

OPERATING TEMPERATURE: -70°C to +235°C
Peaks at +300°C



Dielectric Strength: from 2,5kV to 13,5kV

Relats VSC25TS technical information:

| Property | Test | Result |
|---------------------|---|--|
| Heat Resistance | UL1441: 7 days at +265°C 60 days at +235°C | No cracking or detachment of coating shall be visible and the original colors shall be clearly recognizable. |
| Flammability | FMVSS 302 | Self-extinguishing |
| Cold Resistance | Bending at low temperature IEC60684 - Part 2 Clause 14 at -70°C | No cracking or detachment of coating shall be visible. |
| Chemical Resistance | Simulation of real operating conditions | Compatible with most insulating varnishes and transformer oils. |
| Dielectric Strength | UL1441 | Minimum 2,5 kV ; Average: 4,0 kV |

DESCRIPTION:

Revitex Therm Tape Cord is composed of woven fiberglass tape and knitbraided fiberglass yarn filled with textured fiberglass threads.

The most common construction involves the use of electrical grade braided fiberglass cord which is wrapped, sewn and fully encapsulated in woven fiberglass tape.

The support cords are free of oil-dextrine.

OPERATING TEMPERATURE: -70°C up to +600°C

ITS MAIN FEATURES ARE:

- Highly flexible
- Highly strong
- Resistance to oils, solvents and most chemicals
- Halogen free
- Asbestos free

DIMENSIONS:

| Reference | Diameter (mm) | Diameter tolerance (mm) | Width (mm) | Wall thickness (mm) | Standard Packaging (m) |
|------------|---------------|-------------------------|------------|---------------------|------------------------|
| CFVB304005 | 5 | ± 0,5 | 40 ± 5 | 0,30 ± 0,03 | TBD |
| CFVB306007 | 7 | ± 0,5 | 60 ± 5 | 0,30 ± 0,03 | TBD |
| CFVB306008 | 8 | ± 0,5 | 60 ± 5 | 0,30 ± 0,03 | TBD |
| CFVB306010 | 10 | ± 0,5 | 60 ± 5 | 0,30 ± 0,03 | TBD |
| CFVB306012 | 12 | ± 0,5 | 60 ± 5 | 0,30 ± 0,03 | TBD |

NOTE: Standard colour: White
Other diameters supplied upon request.

Application:

- Tape Cord keeps the banding tapes locked during the centrifugal force generated by the movement of the rotor.



Relats Tape Cord



Banding machine



Banding process

DESCRIPTION:

Revitex Therm Support Cord is composed of braided polyester yarn and filled with textured fiberglass threads.

This is a product to be used as a support cord in motors and generators. The consistency of this product range could varies depending on the final application.

The support cord are free of oil-dextrine.

OPERATING TEMPERATURE: -70°C to +180°C

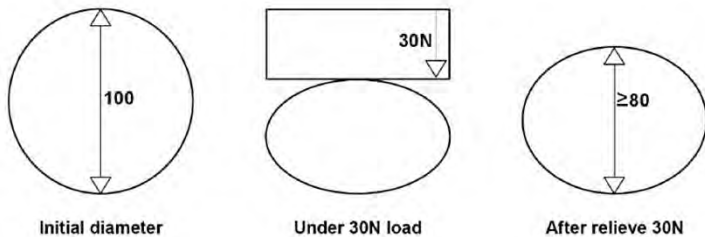
ITS MAIN FEATURES ARE:

- Halogen free
- Oil-dextrine free
- Asbestos free
- Excellent chemical resistance
- Excellent compatibility with insulating varnishes

TECHNICAL CHARACTERISTICS:

Compressibility: Apply 30N load and when relieved should return $\geq 80\%$ of its initial diameter.

Example:



Application:

- Support Cord is widely used to tight and brace the coil winding into the stator to optimize space, avoid inner air and **improve motor efficiency thanks to its high performance density.**



DESCRIPTION:

Sleeving made of fiberglass braid coated with silicone rubber as a first internal layer. As second external layer made of a braided polyester sleeving with acrylic impregnation.

OPERATING TEMPERATURE: -70°C to +155°C
Peaks at +180°C

ITS MAIN FEATURES ARE:

- Halogen free
- Self-extinguishing
- Good abrasion resistance
- Guillotine cutting
- Good fraying resistance
- Excellent chemical resistance to oils, fluids and aggressive chemical agents



DIELECTRIC STRENGTH:

| Test | Method | V2A 25 |
|---------|------------------------|---------|
| | | Minimum |
| UL 1441 | 25 mm Inst. B / D (kV) | 6,0 kV) |

TECHNICAL CHARACTERISTICS:

| Property | Test | Result |
|---------------------|---|--|
| Heat Resistance | Bending after heating IEC 60684 Part 2 Clause 13 48 hours at +155°C | No cracking or detachment of the surface shall be visible |
| Chemical Resistance | Simulation of real operating conditions | Compatible with most insulating varnishes and transformer oils |
| Cold Resistance | Bending at low temperature IEC 60684 Part 2 Clause 14 at -70°C | No cracking or detachment of coating shall be visible |

DESCRIPTION:

Braided sleeving made of multifilament polyester (polyethylene terephthalate). Its main characteristic is the special form of braiding which allows increasing the interior diameter of the sleeving considerably, the sleeving at the same time contracting in length.

Due to the special disposition of the yarns the coverage of this sleeving is almost 100% in all of its expansion range.

OPERATING TEMPERATURE: -40°C to +150°C

ITS MAIN FEATURES ARE:

- Halogen free
- Chemical resistance
- Abrasion resistance
- Self-extinguishing



DIMENSIONS:

| BOPU "a" | Reference | Nominal Diameter (mm) | Maximum Diameter (mm) |
|----------|------------|-----------------------|-----------------------|
| BOPU 12 | P881100133 | 10 | 12 |
| BOPU 14 | P642200121 | 12 | 14 |
| BOPU 16 | P802200121 | 14 | 18 |
| BOPU 18 | P801100319 | 16 | 20 |
| BOPU 20 | P962200121 | 18 | 22 |

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Relats, S.A.

C.Priorat, 17. Pol. Ind. La Borda
08140 Caldes de Montbui
Barcelona. Catalonia. Spain
T +34 938 627 510
relatshq@relats.com

Relats Insulation Material (Suzhou) Co. Ltd

169 Meixin Road
Zhenze Town, Wujiang City 215231
Jiangsu Province. R.P. China
T +86 512 8155 7766
relatschina@relats.com

Relats México S.A. de CV

San Javier, 107. Puerto Interior
CP 36275 Silao
Guanajuato. México
T +52 472 748 9100
relatsmexico@relats.com

Relats Maroc Sarl

Ilot D
Zone Franche d'Exportation de Tanger. Gzenaya
Route de Rabat à Tanger. Maroc
T +212 539 398 850
relatsmaroc@relats.com

Relats Japan Inc.

7F Nittoku Building
3-3-14 Shiba, Minato-Ku
Tokyo 105-0014 Japan
T +81(0)3 6453 8310
relatsjapan@relats.com

Relats Vietnam Co. Ltd

Lot 18, Dien Nam-Dien Ngoc Industrial Zone
Dien Ban Town,
Quang Nam Province. Vietnam.
relatsvietnam@relats.com



Business Units:



www.relats.com