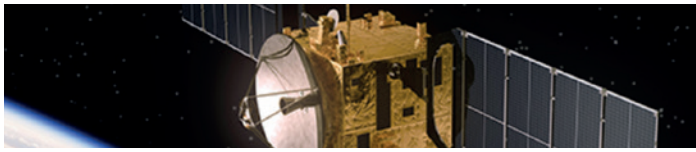
RAYFAST

The Global Supplier with the Personal Touch

Technical question? ask our online chat

Space Products

Electrical Harnessing Component Solutions for Space



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Rayfast provides specialised technical products and solutions to the global Space, Defence, Civil Aviation, Medical, Motorsport, Rail and Industrial markets.

Our product portfolio includes High Performance Lightweight Wire & Cable, Interconnection products, Identification & Protection products.

Rayfast is part of the Interconnect Solutions Group. An international group of companies operating in 8 locations around the world providing technical solutions and specialised products to the aerospace, defence, industrial and energy industries. Operating directly to market through facilities in the UK, USA, France, Germany, the Interconnect Solutions Group is proudly part of Diploma PLC.

Our **Space Product Portfolio** consists of a variety of products that can be used in the Space Industry.

Many of our products also have ESA approval or NASA registration and some have low-outgassing properties, whilst others can be used in applications where this is not a requirement.

Wire and Cable

High performance wire and cable constructions for ground and flight applications

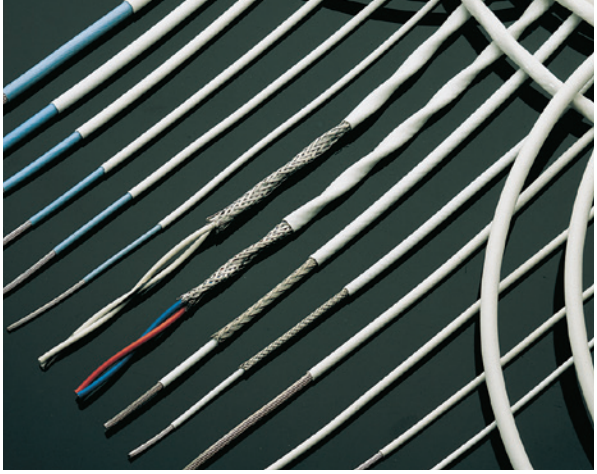
Key Attributes include:

- Small size/Lightweight
- Flexible
- Low outgassing materials
- Op.Temp. Range -200°C to +200°C
- Excellent mechanical properties

Specifications/Approvals include:

NASA preferred product list and European Space Agency Approvals

- ESA/ESCC 3901 – Wire & Cables, 600v, Low frequency
- ESA/ESCC 3902 – Coaxial Cables
- NASA SP-R-022A



For applications where low outgassing and/or NASA/ESA approvals are not required, our generic high performance wire and cable spec 44 & 55 ranges are also readily available in multiple gauge sizes, colours and constructions.

ESCC Wire and cables

Product Family	Description	Operating Temperature	Comments
3901 001	Polyimide insulated wires and cables	-100°C to +200°C	Large conductor guages: AWG 12 to 16
3901 002	Lightweight polyimide insulated wires and cables	-100°C to +200°C	Smaller conductor guages than the ESCC 3901 001 family: AWG 18 to 28
3901 012	Extruded cross-linked ETFE insulated wires and cables	-100°C to +200°C	Large range of conductor guages from AWG 12 to 30
3901 013	PTFE insulated wires and cables	-100°C to +200°C	Internal cabling of electronic boxes. PTFE allows for a thinner jacket and improves flexibility
3901 018	Polyimide/Fluorothermoplastic insulated wires and cables	-200°C to +200°C	Low Earth Orbit (LEO) applications. Jacket resistant to atomic oxygen (ATOX) environment
3901 019	CELLOFLON® /Polyimide insulated wires and cables	-200°C to +200°C	Cryogenic applications (optical instruments), and wherever mass is a critical issue. Celloflon® is a weight saving material with high stability across large temperature range
3901 020	Extruded cross-linked ETFE insulated wires and cables	-200°C to +200°C	Large range of conductor guages from AWG 12 to 30
3901 021	CELLOFLON® /Polyimide insulated wires and cables with drain wire	-200°C to +200°C	Same as 019 family. In addition, a drain wire is provided to ease shield construction
3901 024	Abrasion Resistance Tape (ART®) PTFE insulated wires and cables	-200°C to +200°C	Abrasion Resistance ART® PTFE tape with improved flexibility and bend radius

Coaxial and Triaxial cable

Product Family	Description	Operating Temperature	Comments
3902 002	Coaxial cable: CELLOFLON® PTFE dielectric	-200°C to +180°C	Coaxial line with 50 or 75 Ohms
3902 002	Triaxial cable: CELLOFLON® PTFE dielectric	-200°C to +180°C	Triaxial line with 50 or 75 Ohms
3902 002	Twisted pair bus cable	-200°C to +180°C	Balanced shielded line with 75, 100 or 120 Ohms
3902 003	SpaceWire quadribus cable	-200°C to +180°C	100 Ohm LVDS protocol

RF & Fiber

UTiPHASE® Phase-Linear Microwave Cable Assemblies

The UTiPHASE™ line combines every traditional feature of UTiFLEX with a thermally phase-stable proprietary dielectric that eliminates the PTFE "knee." UTiPHASE also leverages the same cable assembly terminations and proven connector families that have made UTiFLEX famous, thus saving money, validation schedules, and lead times.

Features

- Linear thermal phase performance
- Naturally ruggedized with sturdy concentric core
- Vertically integrated
- Typical velocity of propagation 80%
- Universally configurable with standard connectors and armor

Benefits

- Minimizes system phase variation
- Increases accuracy
- Eliminates PTFE "knee"
- Improved reliability and crush-resistance
- Controlled flouropolymer performance
- Reliable delivery
- Excellent insertion loss
- Drop-in replacement for many competing cables
- Proven UTiFLEX assembly reliability and performance
- Reduced lead time using existing assembly hardware and techniques

UTiFLEX® Ultra-Light Cable Assemblies

Key Features

- ARACON® outer shield for superior weight savings
- Up to 25% weight savings for spaceflight applications
- Low VSWR (1.25:1 to 40 GHz typical)
- Excellent shielding effectiveness

LITEflight® EP Fiber Optic Cables

We have many options for radiation-hardened, single-mode, and multi-mode fiber optic cable compliant to MIL-PRF-49291. LITEflight® EP (Enhanced Performance), our family of aerospace grade fiber optic cables, provides all the performance and benefits of its predecessor, LITEflight HD, but with:

- Lower loss
- Tighter bend radius
- Improved thermal stability
- Better handling during termination and installation

Unlike tight-structured cables, LITEflight EP semi-loosestructured cables are compatible with all commercially available fiber optic termini and connectors. It is available in multiple sizes, configurations, and temperature ratings to 260°C in order to meet the most demanding application requirements.

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RF Cables and Assemblies

High performance cable and assemblies for satcom, space flight and ground testing applications

Specifications/Approvals include:
- NASA EEE-INST-002
- ESA 3902
- ESA 3402

Sucoflex 100

The low loss, high performance microwave cable assembly

- For static and dynamic applications up to 50 GHz
- Excellent return loss
- A range of connectors available, including types which feature NWA-specific interfaces, and can be provided with various ruggedizations to protect the assembly against different environomental influences
- Stock assemblies available

Sucoflex 300

The light-weight, low-loss microwave cable assemblies

- Consistent outstanding mechanical and electrical performance, stability and reliability up to 40 GHz
- Weight reduction of up to 40% compared to our conventional products
- Assemblies produced in a clean environment room (class 100)

Sucoflex 500

Sucoflex 500 assemblies guarantee the highest level of satisfaction Torque, crush and kink resistant

- Precise and repeatable measurements
- Long service life
- Reduce total cost of test with durable, reliable performance
- Increased test and measurement efficiency saving costs due to reduced calibration intervals

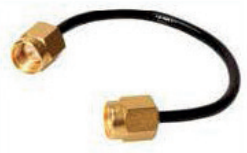
High performance assemblies

The light-weight, low-loss Sucoflex 300 series of microwave cable assemblies offer outstanding mechanical and electrical performance, stability and reliability up to 40 GHz.

Offering weight reduction of up to 40% Sucoflex 300 cable assemblies are produced in a clean room environment (class 100).

Minibend HBR

A truly flexible, solderless coaxial cable assembly designed for use in low profile, internal, point-to-point interconnections between RF modules within communications systems. Minibend replaces 0.047, 0.086 and 0.141 inch custom semi-rigid cables with standard flexible cables, eliminating the need for predefined custom lengths and bend configurations.



High radiation resistance

We also extend our RF cable assembly portfolio with five-shielded cable assemblies for high radiation space applications.

The minibend HBR offers a frequency range up to 65 GHz and industry leading 200 MRad radiation resistance.

TVAC assemblies

Assemblies used within the vacuum chamber must meet ECSS-Q-ST-70-02 C and NASA reference publication 1124 outgassing standards to prevent contamination of the chamber or equipment by solvents evaporating from certain materials.

To prevent internal stresses within the cable assemblies, TVAC connectors contain venting holes that allow an unimpeded flow of air into and out of the components during pressurisation/ depressurisation cycles.

High power solutions

The PSM (Power Sub Miniature) interface meets the increasing demand for cost effective, low weight and power sensitive aerospace applications.

The PSM connector system enables customers to maximize connector density and minimize overall system weight.

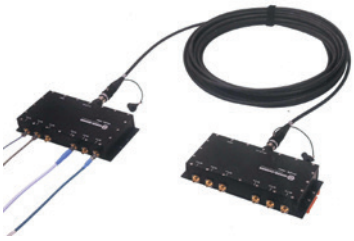
High power cable assemblies

The 32071 cable assemblies are optimised for extremely high power handling applications. The dielectric core construction provides uncompromising mechanical strength and durability along with a high velocity of propagation.

These cable assemblies are ideal solutions for high power space flight and TVAC testing applications.

RF Cables and Assemblies

High performance cable and assemblies for satcom, space flight and ground testing applications



RF-over-Fiber

With customers requiring that new solutions and systems combine various technologies, we are able to provide our customers with end-to-end hybrid technology solutions. The RF-over-Fiber series enables the use of radio frequency and fiber optics in a single system.

Flexible low loss RF cables

The Spuma product family stands for lowest loss with halogen free materials. Shielding and VSWR are optimised up to 6 GHz. The cables are more flexible than corrugated ones, allowing easier handling and installation. Tight bending radii are possible. With this set of features, Spuma can support a multitude of applications.

Sucotest – the highest standard of measurement

Sucotest is ideal for daily use in component and assembly shops, test labs and high speed digital testing applications up to 40 GHz. Sucotest 18A armoured test assemblies are ideal for testing wireless communication infrastructures and outdoor use.

RF and Board Connectors

Our space flight-qualified connector portfolio has been designed for use within the most unique, robust and challenging applications.

Our wide range of state-of-the art connector interfaces, panel mount geometries, and customized solutions continue to drive significant growth in a highly specialised and dynamic technical sphere.

SMA

- Very high axial float – best in class
- High output power
- Excellent return loss values
- Smallest board-to-board distances in class

QLA

- Medium float
- Low cost
- Good board-to-board shielding
- Small board-to-board distances

QMA

- Very high frequencies – best in class
- Low cost
- Very good return loss values
- Smallest board-to-board distances in class

RF and Board Connectors

Specifications/
Approvals include:

- ESA/SCC 3401
- NASA-RP-1124

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BNC

BNC is still a popular connector series, featuring a two stud bayonet coupling mechanism, which is particulary useful for frequently coupled and uncoupled RF connections with frequencies up to 4 GHz. BNC connectors are suitable for applications up to 3 GHz, contrary to the conventional 75 Ω BNC connector types, which are applicable up to 1 GHz only. They can be assembled quick and easy to all convenient cable types.

TNC

TNC connectors are threaded RF connectors applicable from DC up to 11 GHz. The threaded coupling mechanism improves control over the interface dimensions and allows them to be used under a higher environmental load than BNC, especially under a high vibration load. The threaded coupling mechanism allows them to be used under higher environmental load than BNC.

N

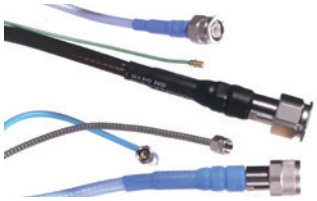
N connectors are available with 50 Ω and 75 Ω impedance. The frequency range extends to 18 GHz, depending on the connector and cable type.
The screw-type coupling mechanism provides a sturdy and reliable connection. The N connectors are available for flexible, semi-rigid and corrugated copper tube cables.

SMPM/SMP

Offering reliable instead of unrivaled miniaturisation and performance for RF applications up to 65 GHz. SMPM/SMP connectors are MIL-SPEC qualified for defense and space flight applications. Together with the unique bend-to-the-end microbend style cable connectors, we offers a large range of PCB mount SMPM/SMP connectors that have been designed with optimized PCB trace launch geometries to offer a complete interconnect design solution from “wire-to-trace”.

SMPM-T

The smallest threaded open source connector on the market. Its unique and innovative combination of a MIL-STD-348 SMPM female interface connector together with a retractable threaded nut provides an integrated solution offering unprecedented electrical and mechanicalperformance.



CT product family

Developed for phase critical applications requiring precision electrical length connectivity. Innovative cable manufacturing technology creates a stable and reliable interconnect solution to satisfy a huge range of customer applications where phase stability is key.

MBX

- Very high axial float – best in class
- High output power
- Excellent return loss values
- Smallest board-to-board distances in class

MFBX

- Medium float
- Low cost
- Good board-to-board shielding
- Small board-to-board distances

MMBX

- Very high frequencies – best in class
- Low cost
- Very good return loss values
- Smallest board-to-board distances in class

Connectors

Circular, rectangular and D-Sub styles offering a wide choice of connection solutions

Specifications/ Approvals include:
- ESA/SCC 3401
- NASA-RP-1124

Ranges include DBAS and D38999 circular series / D-Sub and UR rectangular series

Key Attributes include:

- High reliability
- Lightweight
- High density
- Hermetically sealed

D-Sub Connectors

- Push-Pull coupling
- Ultra Light (20% weight saving)
- Improved EMI Performance
- NASA-RP-1124

D38999

- Full range of style and sizes available
- Scoop proof design
- Space grade materials available

DBAS Series

- Sensitive mating
- Electromagnetic shielding
- Quick release (lanyard)

UR Series

- Rectangular, jackscrew locking for positive mating and alignment
- High density
- Custom versions available for specific programs

Backshells

Connector backshells for strain relief & EMI/EMC protection

Specifications/Approvals include:
- ESA/ESCC 3401/087
  – Lightweight backshells

Sub-D Backshells Key Attributes include:

- Two part design for ease of inspection and re-entry
- Avoidance of screen damage
- Excellent EMI performance
- Milled parts provides precision fit
- Complete connector flange grip
- Captive jack screws

Other circular and rectangular backshells are also available

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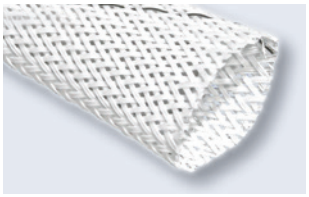
Expandable Braid

Low-outgassing sleeving for wire & cable management and mechanical protection

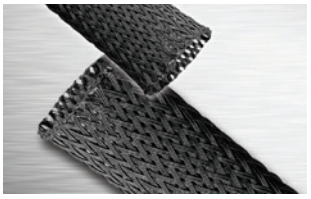
Key Attributes include:

- Meets industry outgassing requirements TML 1.0% max and CVCM 0.1% max
- Excellent resistance to hazardous & aggressive fluids
- Excellent resistance to abrasion
- Low smoke & toxicity generation / VW-1 flammability rating



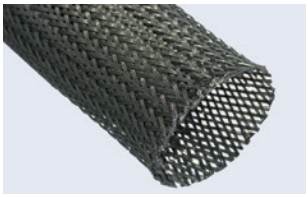
Expando HR

- -70°C to +150°C
- Application range 2mm – 70mm
- Expansion Ratio 1:2 or 1:3



Expando PPS

- -70°C to +200°C
- Application range 2mm – 64mm
- Expansion ratio 1:2 or 1:3



Expando PEEK

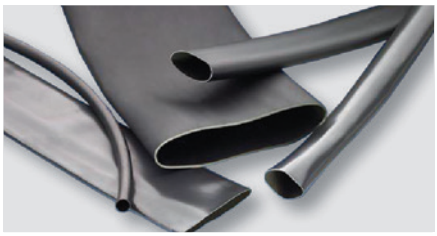
- -70°C to +260°C
- Application range 2mm – 76mm
- Expansion ratio 1:2

Heat-Shrink Tubing

Low outgassing, shrinkable tubing for wire & cable management and protection

Key Attributes include:

- Meets industry outgassing requirements TML 1.0% max and CVCM 0.1% max
- Radiation crosslinked
- Excellent abrasion resistance
- Resistant to chemicals & solvents



RT555 Series

- Temperature rating: -65°C to +250°C
- Application range 1.57mm – 50.8mm
- 2:1 Shrinkable ratio
- NASA SP-R-0022

RW-175 Series

- Temperature rating: -55°C to +175°C
- Application range 0.6mm – 38.1mm
- 2:1 Shrinkable ratio

Identification Solutions

Low outgassing heat shrinkable and tie on cable marker sleeves for wire & cable identification

Key Attributes include:

- Meets industry outgassing requirements TML 1.0% max and CVCM 0.1% max
- Temperature rating: -55°C to +225°C
- Flame retarded & extreme fluid resistance
- Custom text printable with thermal transfer printer system

HT-SCE
Heat Shrink Sleeves

- Available as pre-scored marker sleeves
- Application range 0.81mm – 34mm
- 2:1 Shrinkable ratio

HTCM-SCE-TP
High Temperature Cable Markers

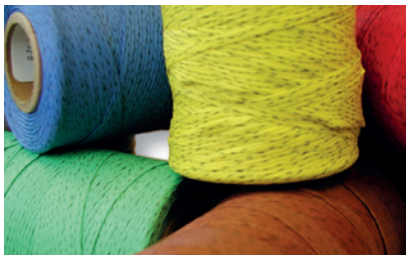
- Retro Fit style
- Application range 5.08mm +
- 4 or 6 hole options available

Accessories

Low outgassing cable management accessories & adhesives

Key Attributes include:

- Meets outgassing requirements TML 1.0% max, CVCM 0.1% max
- Temperature rating: -73°C to +427°C

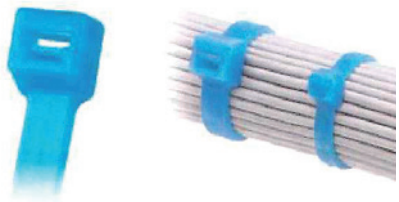


Lacing Tapes

- Polyester (NASA codified)
- Teflon coated Glass Fibre

Key Attributes include:

- Temperature rating: -60°C to +260°C
- Extreme high & low temperature resistance

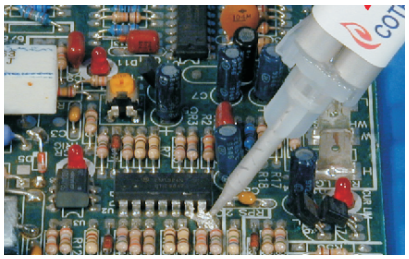


Cable Ties and Mounts

- Halar
- Tefzel
- PEEK

Key Attributes include:

- Electrically and Thermally conductive
- High or low expansion rates



High performance adhesives

- Epoxy series (rated to 340°C)
- Ceramic series (rated to 3000°C)

Fast Steering Mirror Sensors

The new EDA400 controller is the ideal solution for Fast Steering Mirror and differential sensing applications. Featuring two matched pairs of high-resolution noncontact Eddy Current Sensors, the driver with four sensor inputs (two per axis) and a 9-Pin connector interface for easy connectivity.

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Key Attributes include:

- High bandwidth
- Extremely low power consumption
- Excellent temperature stability
- Very low mass
- Nanometer resolution
- Matched sensors for high stability and repeatability

Designed for:

- Fast Steering Mirrors (FSM)
- Telescope and microscope stabilisation
- Image stabilisation

Screening Braid

EMC/EMI shielding protection for wire & cable

Key Attributes include:

- Up to 100% Optical Coverage
- Excellent EMC/EMI performance
- Ease of installation
- Wide range of sizes

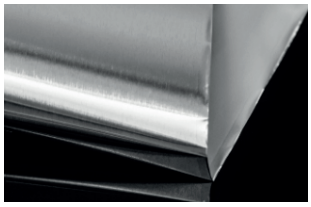
ARACON® is a registered trademark of Carlisle Interconnect Technologies

Braided EMI Shielding

- Tin, Silver and Nickel plated
- Temperature rating: -65°C to +260°C
- Up to 99% optical coverage

Aracon®

- Optical Coverage of 90% minimum
- Temperature rating: -110°C to +150°C
- Weight saving up to 80%



Aluminium Foil

- Wrap around for ease of installation
- Temperature rating: up to +500 °C
- 100% optical coverage

Lightening Protection

Series 3401/3402

Gas discharge tube protectors with exchangeable GDTs, for applications with RF and DC components on the antenna line the standard GDT lightning/EMP protectors feature DC continuity and large bandwidth.

Series 3403

The Hybrid GDT fine protectors recommended for very sensitive DC powered receivers, such as those used in GPS installations. The hybrid GDT fine protectors with integrated transient voltage suppressor diodes guarantee lowest residual pulse energy.

Series 3406

Known as the True broadband GDT protectors, SlimLine GDT protectors feature high return loss in the frequency band between DC and 6 GHz. This design is best suited for point to point and WLAN equipment.

Series 3409

Hybrid/low PIM/high power GDT protectors, this patented technology features low passive intermodulation at extremely high continuous and peak instantaneous power (up to 25 kW PIP).

Series 3410

Bias-T/DC injectors with integrated lightning protector are used to "feed-in" or "pick-off" DC voltage into or from antenna feeder cables, provide the operating voltage for active electronics installed on the mast.

Semper

The Semper design guarantees safe extinguishing of the GDT under high RF power or with additional DC components on the antenna line. By retrofitting standard GDTs with the Semper GDT existing installations can be upgraded. The Semper technology is a true improvement to the standard gas tube technology and increases reliability and lifetime of GDT protectors.

Our Added Value Services

At Rayfast we offer a comprehensive range of Added Value Services, allowing customers to tailor-make from our high-quality products to suit their requirements and applications.

With a prompt turnaround and a dedicated team, we are also able to produce pre-printed identification products, from simple individual markers to large complex kits.

Contact us today for additional information or to discuss your particular needs.

Cutting Services

- Cut piece tubing
- Cut piece sleeving
- Wire and cable spooling

Pre Print Services

- Wire and cable markers
- Tie-on markers
- Adhesive labels
- Identification product support

Cable Solutions

- Custom multi-core cables
- Over-braiding service
- Custom assemblies

Logistics

- Next day delivery
- Technical support
- Flexible MOQ's
- Component kitting
- KanBan and consignment stock
- Component sampling

Supply partners for space products

Amphenol CIT Cable & Interconnect Technologies
BREYDEN PRODUCTS, INC.
TE connectivity AUTHORIZED DISTRIBUTOR
PIC WIRE & CABLE
CABLETEC part of the INTERCONNECT SOLUTIONS Group
HUBER+SUHNER
COTRONICS
PANDUIT
TENNECO SYSTEMS PROTECTION
axon' cable & interconnect

Technical question? ask our online chat

Dedicated Account Managers
Technical Specialist Support
Internal Sales Team
Online Chat, Sales and Enquiries

Quality Accreditations:
ISO9001 and AS9120

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