

# Welcome to the future!

Our complete optical fibre offer opens up a new world of possibilities.



**Prysmian**  
Group

# Linking the future

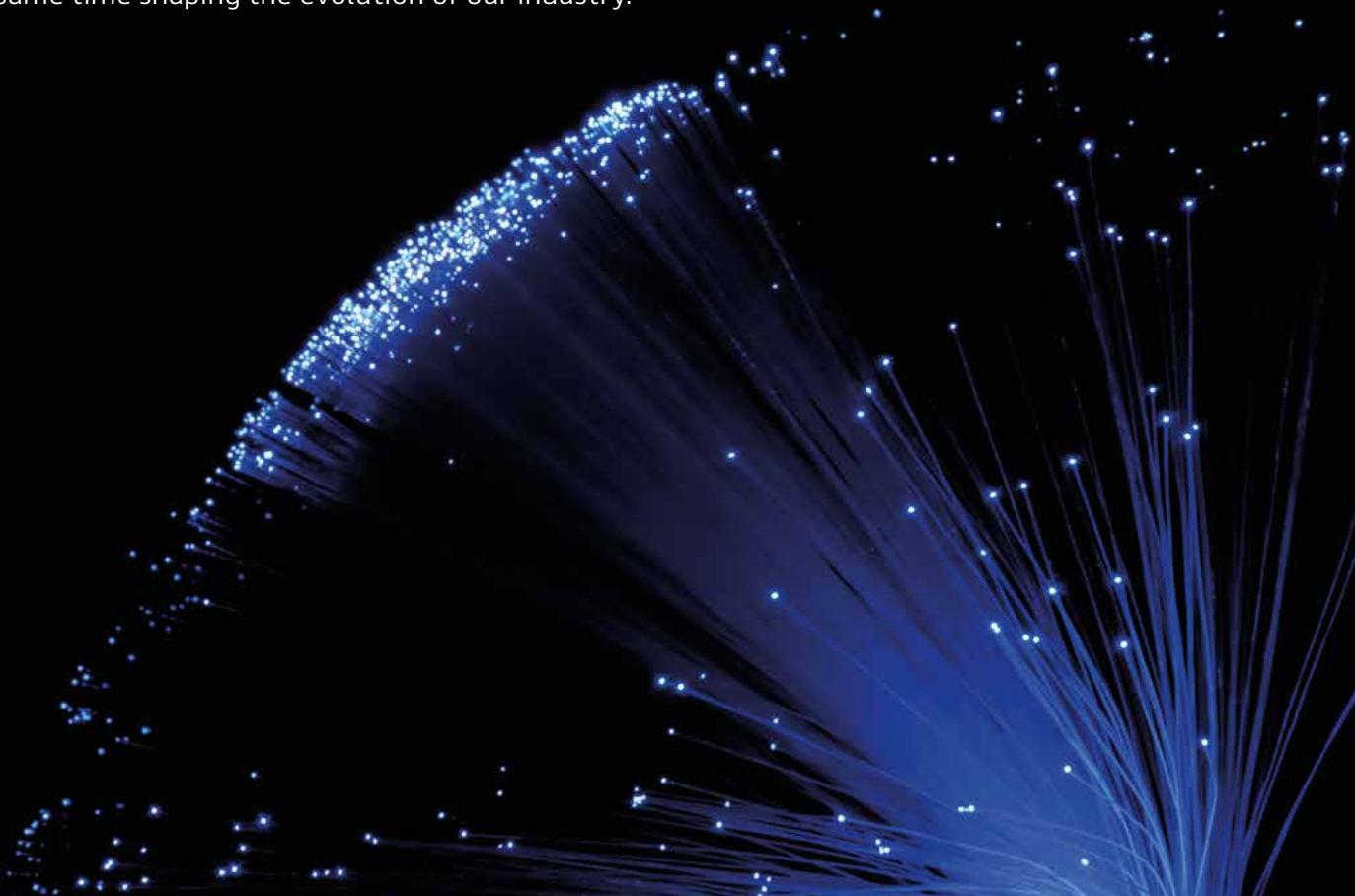
As the worldwide leader in the cable industry, Prysmian Group believes in the effective, efficient and sustainable supply of energy and information as a primary driver in the development of communities.

With this in mind, we provide major global organisations in many industries with best-in-class cable solutions, based on state-of-the-art technology. Through three renowned commercial brands – Prysmian, Draka and General Cable – based in almost 50 countries, we're constantly close to our customers, enabling them to further develop the world's energy and telecoms infrastructures, and achieve sustainable, profitable growth.

In our energy business, we design, produce, distribute and install cables and systems for the transmission and distribution of power at low, medium, high and extra-high voltage.

In telecoms, the Group is a leading manufacturer of all types of copper and fibre cables, systems and accessories – covering voice, video and data transmission.

Drawing on over 130 years' experience and continuously investing in R&D, we apply excellence, understanding and integrity to everything we do, meeting and exceeding the precise needs of our customers across all continents, at the same time shaping the evolution of our industry.



# A new world of possibilities

In the innovative minds of our engineers, knowledge and imagination are fused in order to link the present to the future. And the result is even better than the fairy tales – a complete offer of optical fibre solutions at the edge of the technological revolution. Plus, we provide you with all the services that you might need: before, during and after purchase. Go get ém.

## What we offer

Due to the vast and rapidly increasing network capacity requirements and upcoming technologies such as 5G, closed packed and robust fibre network solutions have become paramount in the development of modern and future infrastructures.

Our portfolio encompasses optical fibres, cables and connectivity together with services and project management – ensuring that not only the right cable but the right total passive optical system is matched to our customers' needs.

We can provide you with a complete range of integrated products that are easy to deploy, flexible, reliable and cost-efficient. Add fibre and cable manufacturing

presence in 12 countries across 4 continents, and you will understand how our global experience and local manufacturing capability is a significant advantage, assuring continuity of supply, state-of-the-art quality and supreme service.

Simply put: what we offer is total support in linking together continents, countries and communities faster and more efficiently than ever before.

*The products and solutions shown in this brochure is a mere selection of all that we can offer. Please visit [www.prysmian.com](http://www.prysmian.com) to see the whole range of products, systems and services that we can offer.*

COMMITTED TO INNOVATION

## The wave of the future.

Internet of Things is the most revolutionary evolution of digital technologies to date, and contributing to the complete realisation and full connectivity is one of Prysmian's main tasks over the next decade. A clear acknowledgement of our efforts is the three-year contract where Prysmian will supply the US telecom company Verizon with more than 17 million kilometres of fibre cables to speed up their deployment of 5G services.



# Why choose Prysmian?

Because, in short, we do it better – and we do it all! From start to finish, and beyond, whether we're talking research and design, creation and testing, installation and post-deployment – we have every aspect covered.

## Unmatched reliability

Our products are tested in accordance with world-class standards such as IEC and Telcordia. And 100% of test reports are stored in our database for full traceability.

## Unrivalled technology

We control the whole process – from design to manufacture to implementation – and at the core of this process sits R&D. That's why our solutions will fit flawlessly with next generation fibre networks.

## Superior performance

Complete and made-to-measure solutions underwrite peak performance on all levels of our offer.

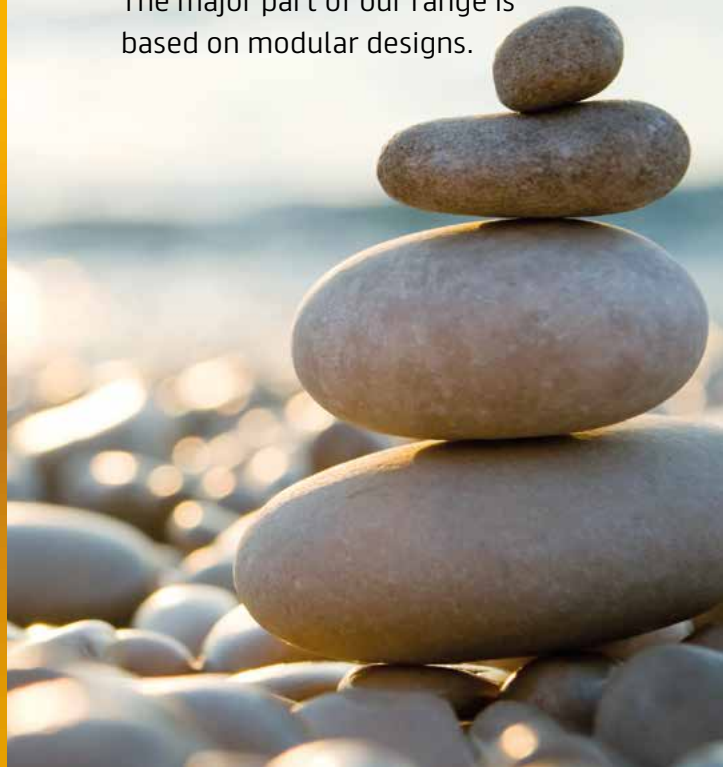


## Cost efficiency

Our products are engineered for rapid installation and easy maintenance.

## Simple upgrading

The major part of our range is based on modular designs.

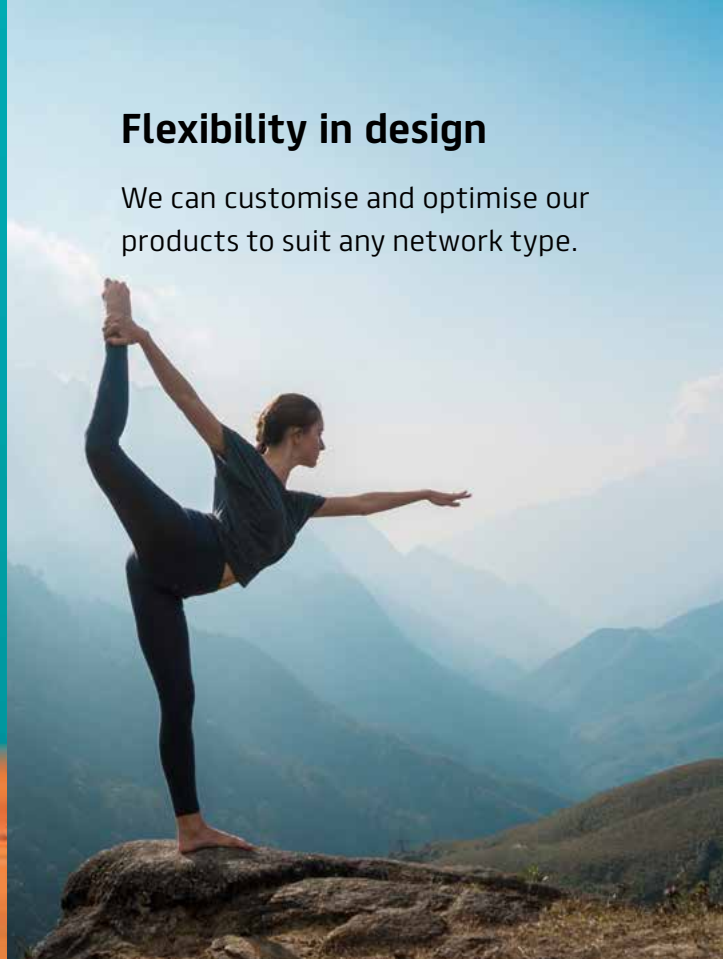


## Seamless service

A dedicated supply chain means on time delivery and flexibility. We also guarantee a response within 48 hours.

## Flexibility in design

We can customise and optimise our products to suit any network type.



# A complete offer

Our complete selection of optical technologies, fibres and fibre cables have been designed, developed, manufactured and tested to meet even the most challenging of conditions. These, in combination with connectivity products constitute a complete range of solutions to address every customer's specific needs. With this integrated range of solutions, it is easier than ever to plan and deploy a next-generation network quickly, making the projects simple, transparent and manageable – and deliverable at the lowest possible cost.

## Optical fibres

We manufacture a full range of single mode, multi-mode and specialty optical fibres that have been specifically designed, developed, manufactured and tested to meet even the most challenging of demands. Combined with our proprietary technologies and production processes, our expertise allows us to create complete customer specific solutions.

### SINGLE MODE FIBRES

The single-mode fibre portfolio is reflected in a complete range of products:

- **BendBright<sup>XS</sup> 180 µm bend insensitive fibre fully compliant with G.652 and G.657.A2 global standards**
  - World's first 180 micron bend insensitive fibre pushes dimensions to an unprecedented lower level. Miniaturized optical cables are key to sustain future digital developments and BendBright<sup>XS</sup> 180 µm diameter fibre will enable new cable systems with extreme fibre density and smaller diameter. The dimensional reduction of 180 µm fibre corresponds to half of the cross-section area of legacy 250 µm single-mode fibre while preserving a 125 µm glass diameter.
- **Bend-insensitive optical fibres G.657 series**
  - with BendBright<sup>XS</sup> technology critical for FTTx rollouts.
- **Broadly spread G.652 series**
  - the most deployed fibre type worldwide that can be used in all cable constructions including Loose Tube, tight buffered, ribbon and central tube designs offering superior performance in long haul, metropolitan, access and premises applications for telecommunications, CATV and utility networks.
- **Submarine and ultra long-haul G.654 series**
- **Innovative long-distance G.655/G.656 non-zero dispersion shifted fibres (NZDSF) series**
  - developed for optimized dispersion characteristics in high-capacity, long-distance networks.

Our Single-mode fibres are also equipped with Prysmian's revolutionary ColorLock<sup>XS</sup> coating technology. The fibre coating comes with an integrated vibrant colour in the outer primary coating layer, making the colour embedded as a component of the coating.

Advantages of the ColorLock<sup>XS</sup> technology:

- ✓ **Increased reliability, durability, and superior aging performance**
- ✓ **Lower maintenance and replacement costs**
- ✓ **Improved fibre identification and colored fibre reliability**

### MULTI MODE FIBRES

Multi-mode fibres are intended for all applications where the distances covered are short and the points of access to fibre many, such as Local Area Networks (LAN) or all networks with a small reach like campus, buildings or offices. A multi-mode fibre also enables connections for backbone, riser and horizontal links. Prysmian Group's multi-mode optical fibres for the Datacom, enterprises and premises cable industries are based on our Plasma-Activated Chemical Vapour Deposition Process (PCVD), acknowledged worldwide as offering the best core-profile accuracy in multimode fibres. The result is a complete portfolio covering the full range of application standards, from OM1 and OM2 optical fibres, right up to high-data-rate OM3 and OM4.

- **WideCap**
  - is a multi-mode fibre with extended capacity to satisfy increasing demand in Data Centres. Based on OM4 and VCSEL technology, WideCap provides a low cost and power efficient solution for data centre networks using parallel multimode fibres. In addition, extended reach, fibre efficiency and low-power consumption can be achieved simultaneously by combining 4x25 Gbps WDM VCSEL transceivers with WideCap.

WideCap is the first multimode fibre optimised for multi-wavelength systems, extending the traditional operating window of traditional OM4 fibres to 950 nm – adding three channels to the regular OM4 850 nm.





## SPECIALTY FIBRES

DrakaElite is Prysmian Group's Specialty Fibre suite, dedicated to the specialty market segment. It includes a comprehensive product range offering solutions as well as active and passive components for the Medical, Marine, Oil & Gas, and Telecoms sectors. With more than two decades of experience in the field of optical fibre technologies, a unique proprietary process, and an extended patent portfolio, DrakaElite offers an extensive number of solutions that exceed the requirements of your applications or the market: High-Temperature coatings, Radiation hardened optical fibre, tight geometry optical fibres, and many more.



## Optical fibre cables

Our state-of-the-art optical fibre cable range covers the whole chart. The extensive range is available in a wide range of fibre counts, fibre types and mechanical constructions, including the ultra-high fibre count cable MassLink™. The majority of the cables are provided with fire retardant sheaths and are compliant with CPR certifications.

- **Aerial cables:**

- FTTH distribution (short span cables)
- Core/backbone network (short and long span cables)

- **Underground optical cables:**

- Standard duct, minicables, direct buried cables

- **Indoor optical cables:**

- Riser-, drop-, central office/data center cables

- **Indoor/Outdoor optical cables:**

- Facade-, drop-, central office/data center cables

- **Special cables:**

- Submarine/subaqua, tunnel and circuit integrity, QFCI for Oil and Gas – circuit integrity, ALPAM/Oil and Gas, OPGW (Optical Ground Wire) and hybrid cables for mobile or remote power applications





## Connectivity products

Our vast portfolio also includes connectivity products made to measure both our own and other fibre cable solutions on the market. The high-end products are designed for versatility, covering all cable management needs, whatever the network types within aerial and underground installations, central offices, exchanges, customer premises and external networks.

- **Rack-mounted and Racks**

- Sub rack system (SRS4000) & Rack system (RS4000)
- Street Cabinets (SC)

- **Joints**

- Large multi-function Joint (LMJ)
- Compact and Medium multi-function Joint (UMJ, CMJ, MMJ)
- Small Joint Closure (SJC)

- **Wall boxes**

- Large Distribution Wall Box (LDWB)
- Medium Distribution Wall Box (MDWB)
- Small Distribution Wall Box (SDWB)
- Medium Termination Wall Box (MTWB)
- Small Termination Wall Box (STWB)
- Modular Distribution Box (MDB)
- Small and Medium OneBox

- **Customer termination boxes**

- Ultra-Compact Termination Box Mk2 (UCTB Mk2)
- Compact Termination Box Mk2 (CTB Mk2)
- Compact Termination Box Mk3 (CTB Mk3)
- External/Internal Compact Termination Wall Box (ECT)T

## Pre-connectorized products

Additionally, we offer an extensive range of high-performance optical fibre accessories as an essential part of an integrated product or networking solution.

- **Indoor Solutions**

- Adapters
- Pigtailed
- Patchcords
- Splitters and splitter modules
- Pre-connectorised Compact Termination Boxes (CTBs)
- Pre-connectorised breakout

- **Outdoor Solutions**

- Pre-connectorised Enhanced Performance Fibre Unit (EPFU)
- Pre-connectorised Lead-In Assembly (LIA)
- Pre-connectorised CTBs

- **Co-Existent Solutions**

- CoEx LGX module Type 1 to 6
- CoEx compact module Type 1 to 6

- **High Density Solutions**

- MPO Cable Assembly
- MTP® Cable Assembly



# Optical fibre cables technologies

Our cable management technologies include everything from standard and well-known Loose Tube options and easy-to-use FlexTube® micromodules, to FlexRibbon™ using extremely flexible fibre ribbons to bundle the maximum number of fibres into the smallest possible cable and Special Cables designed to deliver high-speed data even in the harshest of environments.

## Loose Tube

Loose Tube optical cables, generally including up to 12 optical fibres per tube, is a well-known technology used in all areas of the optical infrastructure. The structure can be reinforced with glass threads or two longitudinal resistance elements placed at 180° as well as with water blocking layer, reinforcement layers and different materials for outer jacket.

### Application






All Loose Tube cables are designed for external underground or aerial installations in ducts by pulling, jetting or floating techniques, or by direct burial in open-cut trenches. By customizing the cable construction, they can also be used in various applications such as areas with high risk of rodent or termite presence.

### Main advantages

- ✓ **Well known technology**
- ✓ **Already deployed products with reliable performances**
- ✓ **Small sizes for low fibre count cables allowing higher density for blown application**

### Loose Tube range of products

Classified by the positioning of the tube, there are two type of Loose Tube cables.

	UniTube (Central Loose Tube)	Loose Tube (Multi Loose Tube)	
	Tube with optical fibres is centrally positioned.	With several tubes wrapped around a central resistance element.	
			
		<b>Mini Loose Tube</b> 	<b>Standard Multi Loose Tube</b> 
No. of fibres	Typical configuration of 12f	Typical range 12–288f	
Approx. tube diameter (mm)	3.0	1.5 to 1.35	2 to 2.5
Approx. sheath thickness (mm)	1.2	0.5	1.5 to 2.5
Approx. cable diameter (mm)	6.6	5.7 to 10.8	8 to 18
Approx. cable weight (kg/km)	35	30 to 83	60 to 300

Multi Loose Tube cables with higher fibre count						
No. of fibres	384f	432f	576f	624f	768f	864f
Approx. tube diameter (mm)	2.8					
Nom./min. sheath thickness (mm)	1.5 / 1.3					
Approx. cable diameter (mm)	19	22	22	25	27	
Approx. cable weight (kg/km)	295	390	412	532	620	





## FlexTube®

FlexTube® is an optical micromodule, which can be built into many different designs of internal or external cables for extensive and widespread applications. This technology is made of a soft, flexible material which makes it very easy to handle and use.

### Application

FlexTube® is used in all areas of the optical infrastructure with visible advantages for distribution in FTTH applications. By adding constructive elements to the cable design or changing materials, the FlexTube® cables can be used in different applications withstanding various types of risks.

### Main advantages

- ✓ **Reduced installation time**
- ✓ **Reduced total cost of ownership**
- ✓ **Very small cable size for higher fibre density**
- ✓ **Allows fibre midspan access**
- ✓ **Give the possibility to reduce the size of connectivity products**
- ✓ **More secure during installation, operation or maintenance of the infrastructure due to the flexible tubing**
- ✓ **Retractable product range were the number of splices is reduced to the minimum for indoor or outdoor application are available**

	Standard duct cables	Cables for blowing applications	Cables for aerial applications	Drop cables
No. of fibres	Available up to 864f*	Typical range 12-144f	Typical range 12-144f	Up to 12f
Approx. cable diameter (mm)	6 to 19	5.8 to 8.4	6 to 14	6
approx. cable weight (kg/km)	30 to 400	25 to 50	30 to 140	30

\*The typical FlexTube® families are available in fibre counts up to 864. Higher fibre counts are available as customized solutions.

## FlexRibbon™

This advanced technology enables fast deployments of very high fibre counts especially in datacentres, but can also be used for fast deployments in other areas of the network. FlexRibbon™ technology can offer the maximum number of fibres into the smallest possible cable design. It is achieved by using extremely flexible fibre ribbons that can be rolled up for high-packing densities or laid flat for ribbon splicing.

### Application



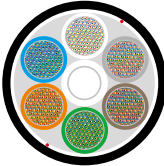


FlexRibbon™ cables are suitable for FTTH applications and for large scale data centers where there is a high demand of fibers.

### Main advantages

- ✓ Gives the possibility to decrease splicing time due to ribbon technology
- ✓ Can be used in standard Loose Tube structures
- ✓ Maximizes fibre density and duct space utilization
- ✓ Kink resistant and highly flexible
- ✓ Are lightweight and easy to handle

### FlexRibbon™ range of products

Prysmian Group offers an extensive range of FlexRibbon™ optical cables that are available in a wide mix of fibre counts, fibre types and mechanical constructions depending on the specific application.

	FTTH cables		Data Centers		
	Duct FlexRibbon™ cables		1728 MassLink™ with FlexRibbon™ Technology	3456 MassLink™ with FlexRibbon™ Technology	6912 MassLink™ with FlexRibbon™ Technology
					
No. of fibres	192f	432f	1728f	3456f	6912f
No. of fibres/ micro-module	8 x (2 ribbons x 12f)	12 x (3 ribbons x 12f)	6 ribbons x 288f	16 ribbons x 216f	24 ribbons x 288f
Approx. cable diameter (mm)	7.4	12	24.9	28.2	39
Approx. cable weight (kg/km)	45		379	478	940



## Special cables

Within our vast portfolio of Special Cables, you'll find complete solutions for Fibre To The Antenna (FTTA) designs securing quality of transmission even in the most aggressive environments; hybrid cables including both copper conductors and bend-intensive fibres suitable for every FTTA wireless application as well as Optical Ground Wires (OPGW) systems for installation on High Voltage electric lines.

### Application




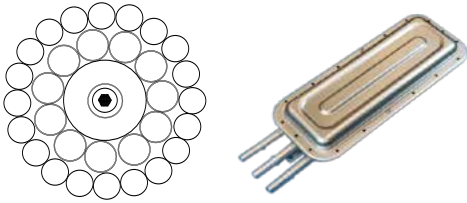
Our Special cables are designed to be applied in customised optical network infrastructures.

### Main advantages

- ✓ **Customization for each application**
- ✓ **Integration of different technologies in the same cable (eg. hybrid)**
- ✓ **Complete set of accessories**
- ✓ **Fully support for products**

### Range of products

Apart from the cable solutions described above, our full range of Special Cables applies to hybrid cables for mobile or remote power applications, submarine/ subaqua cables, tunnel cables and circuit integrity, QFCI cable for Oil and Gas – circuit integrity, ALPAM/Oil and Gas and OPPC systems (Optical Phase Conductor).

Tunnel cables	Hybrid Cables
<p>Cables for tunnels with higher CPR Classifications classes (B2ca) used where is a high risk of fire.</p> 	
Complete solutions for FTTA	OPGW and OPPC
	

# Linking communication to communities

Every unique product and solution end up in all-embracing systems, delivering communication down to every home. With the integrated range of solutions, it is easier than ever to plan and deploy a next-generation network quickly. Our systems make projects simple, transparent and manageable – and deliverable at the lowest possible cost. Straightforward and transparent we add value for network operators in many different ways.

## RetractaNet<sup>XS</sup>

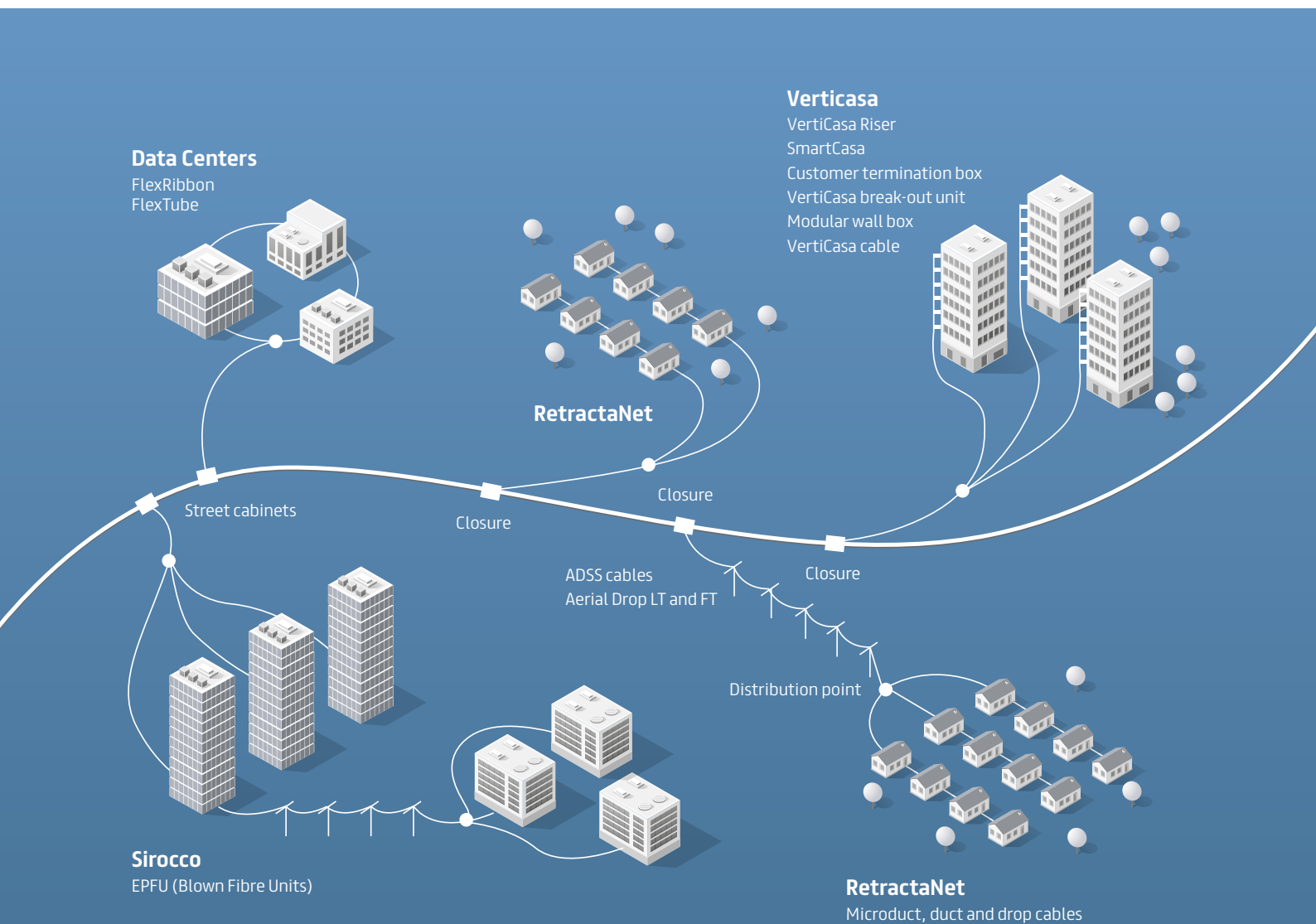
– taking fibre directly to the doorstep

RetractaNet<sup>XS</sup> is our easy to deploy and reliable direct buried drop solution for your existing duct or sub-duct infrastructure. RetractaNet<sup>XS</sup> offers fully integrated connectivity no matter your type of network solution. May it be mobile applications, rural broadband, Wifi or DAS – RetractaNet<sup>XS</sup> will do the trick with minimal installation costs. It's fast, flexible and easy to handle.

## VertiCasa<sup>XS</sup>

– delivering fibre to every floor

No matter the number of floors in high-rise apartments, access to fibre has never been easier. The heart of the VertiCasa<sup>XS</sup> system features a unique concept in optical construction, allowing remarkably easy fibre access and break-out, reducing the demand for skilled labour, installation time and costs.





## Sirocco<sup>XS</sup>

– future-proof blown fibre solutions

Our Sirocco<sup>XS</sup> blown fibre system uses compressed air to blow optical fibre into pre-installed tubes, enabling on-demand deployment of optical fibres from one internal or external network point to another. In addition, it is easy to interrupt existing tube routes to reach new users. That way Sirocco<sup>XS</sup> substantially lowers network building costs while providing a more flexible design.

## Drop Solutions

– making drop connections simple

Our connection solution is a direct buried ducting system for all parts of a fibre optic network – particularly Fibre To The Home (FTTH). By blowing in optical fibre cables through microduct bundles, you get the flexibility to choose what you need, when you need it. And as the thick-walled microducts don't need any outer protection they're easy to branch off too. Straightforward, flexible, cost-effective and user-friendly.

## Data Centres

– pathway to the future

Ultra-High-Density data centre solutions have been engineered specifically to meet the increasing bandwidth demands, posed by billions of connected devices. Including FlexRibbon™ ultra-high-density cables (see page 12), and modules that can be connected by Multi-fibre Push On connectors (MPO), direct termination or splicing, it'll provide you with ultimate flexibility and ease of use.



# Linking the future

Technical data, dimensions and weights are subject to change. All sizes and values without tolerances are reference values. Specifications are for product as supplied by Prysmian Group: any modification or alteration afterwards of product may give different result. The information contained within this document must not be copied, reprinted or reproduced in any form, either wholly or in part, without the written consent of Prysmian Group. The information is believed to be correct at the time of issue. Prysmian Group reserves the right to amend this specification without prior notice. This specification is not contractually valid unless specifically authorised by Prysmian Group.

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