Hybrid and Outdoor Cable Solutions

Product Brochure





5G – Need for Fast and Cost-optimised Network Rollouts

The fifth-generation cellular network, or 5G, is all set to connect the world real time, with supersonic speed. It will bring a paradigm shift to our everyday lifestyle, education, and work making them more engaging, transforming businesses and advancing societies.

The super-fast 5G network that will connect machines, objects, devices, is expected to deliver up to hundred times faster speed than our current 4G connections. It is also expected to reduce energy consumption. This will lower emissions significantly leading to a greener future and will bring in a regime of lower maintenance costs.

Key Dependencies with 5G Roll-out

The success of 5G, however, will significantly depend on the quality and availability of next-generation fibre infrastructure. This new age connectivity infrastructure should be able to connect billions of devices, compute trillions of data and enable networks in healthcare, hospitality, education, transportation, and government to be faster and smarter. 5G infrastructure, therefore, will have to be intelligent, robust, resilient, and scalable.

Currently, almost all fibre network is split architecture based with extensive usage of Common Public Radio Interface cables. These Connecting cables run on separate DC Power and need protection from environmental or physical damage. Cables jumble up in this architecture. The situation gets worse in case of tower-sharing.

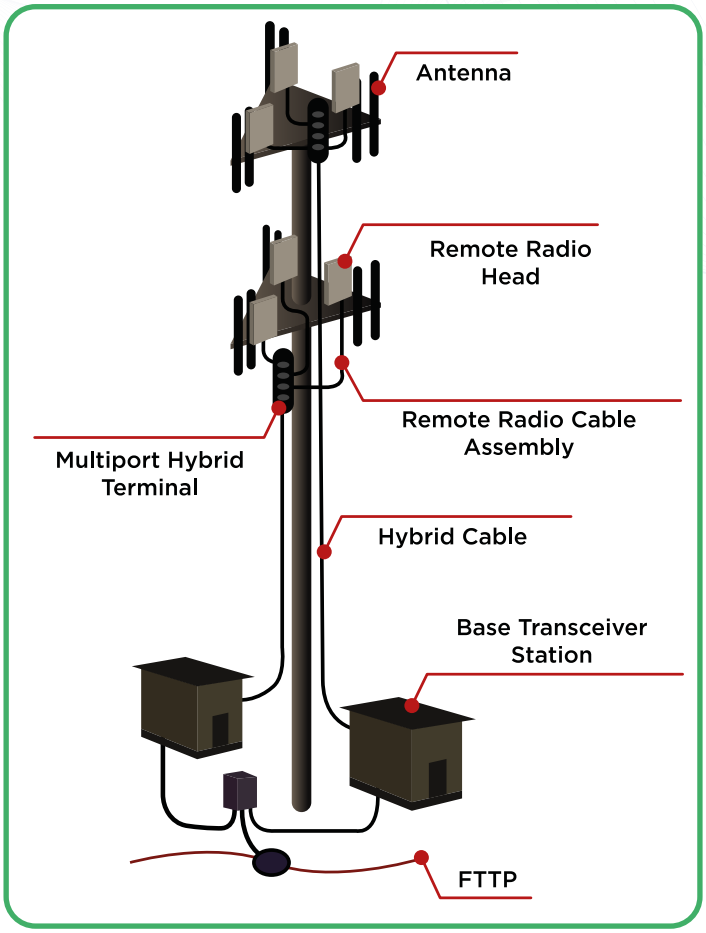
What 5G network providers need is a cabling solution that will solve the current problems, provide for smarter solutions that are not cable-intensive, save resources and costs, and make the most efficient use of space and time.

STL's Hybrid Cables - Making Cabling Smarter

STL brings a range of hybrid cables that are poised to address not only the current, but also the future requirements of the networking industry.

Neither copper nor optical fibre alone, hybrid cables are a blend of both. They replace all Legacy cables and power cables with one cable and an integrated divider that houses all power cables and optical jumpers. They combine optical fibre's high-performance and low-latency with copper's low-voltage DC power connection.

Futuristic in nature, hybrid cables are designed to meet the functionality, complexity, applications, and services demands of the new world. They will deliver lower latency, ultra-high reliability, and higher bandwidth, thereby supporting evolving needs of the network infrastructure.



Features:

- Delivers more power across longer distances than Power over Ethernet(PoE)
- Power and data to low-voltage applications across long distances
- Reduces labour costs and installation time

Optional Characteristics:

- Halogen free
- Flame-retardant
- High mechanical strength
- With single or multimode fibres

Power Support:

Low & Medium Power (15W upto 100W) for Remote Powering and Distance support upto 1000 mtr

Operating Voltage:

12V, 24V, 48V, 57V DC & 220V, 230V, 300V AC

Applications:

- Entrance space
- Ethernet
- DAS
- Digital signage
- Professional AV
- Small cells
- IP-enabled appliances
- HD surveillance cameras
- Wi-Fi access points
- Telecommunications room
- Remote application of low-voltage power

Deployment Types:

Cell Type	Macro	Micro	Pico	Femto
Power Consumption	100 W to 450 W	50 W to 150 W	250 mW to 2 W	100 mW
Coverage Distance	Several kms	Less than 500 m	Less than 100 m	Less than 30 m
Deployment	Outdoor	Indoor and Outdoor	Indoor and Outdoor	Indoor

Customized Options:

Fibre Count	Fibre Type	No of Conductors x AWG
1 - 2 Fibres	SM (G657 A1, A2), OM3, OM4, OM5	2 to 3 x 12-20 AWG
2 - 48 Fibres		2 to 8 x 2-10 AWG
6 - 12 Fibres		2 to 4 x 12-20 AWG
12 - 24 Fibres		4 to 6 x 12-20 AWG
24 - 48 Fibres		6 to 12 x 12-20 AWG

HYBRID CABLE SPECIFICATIONS

Hybrid Cable 2F SM and 2 Core x 1 sq mm (18AWG)

Cable Description:

STL's Hybrid Cable 2F SM and 2 Core x 1 sq mm (18AWG) has two optical sub unit and two copper wires stranded around a central srength member (FRP) to form the core. The LSZH sheath is extruded to form a optical sub-unit. The core is wrapped with water blocking tape and aramid yarns distributed over and around provide tight buffer for strength. The outer sheath is UV stabilized LSZH for overall protection.

Features:

- High tensile strength up to 800 N
- UV stabilized LSZH outer sheath
- Power and tight buffer cables stranding together for compact design.
- Bending 15 D
- Operating -30°C to 70°C
- Power and data in a single cable for long distance
- Easy connnectarization and compatible with electronics devices

Applications:

- Complete power and data system for IP devices
- Requirement of power and connectivity to Remote Radio Units in a C-RAN deployment (small cell)
- Low voltage power provided by centralized source / backup UPS
- Low-cost installation and set-up
- Perfect for small cells, airports and stadiums.
- Power Source: 48 V DC supply.

Power Budget for Remote Powering:

	30 Watt	50 Watt
18 AWG (1 SQMM)	106 mtr @ 5% Voltage drop	63 mtr @5% Voltage drop
	200 mtr @ 10 % Voltage drop	120 mtr @ 10% Voltage drop
	284 mtr @ 15 % Voltage drop	170 mtr @ 15 % Voltage drop

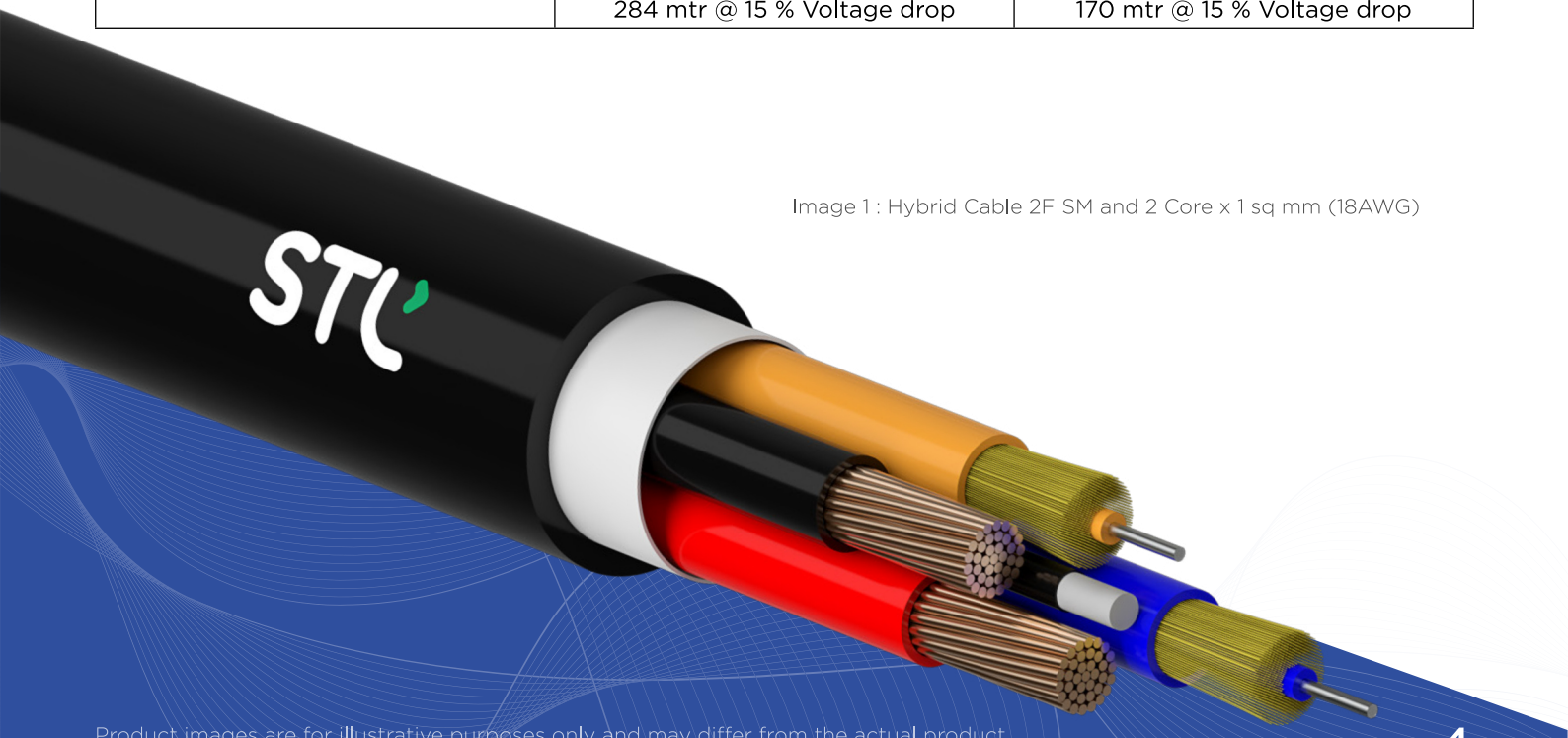


Image 1 : Hybrid Cable 2F SM and 2 Core x 1 sq mm (18AWG)

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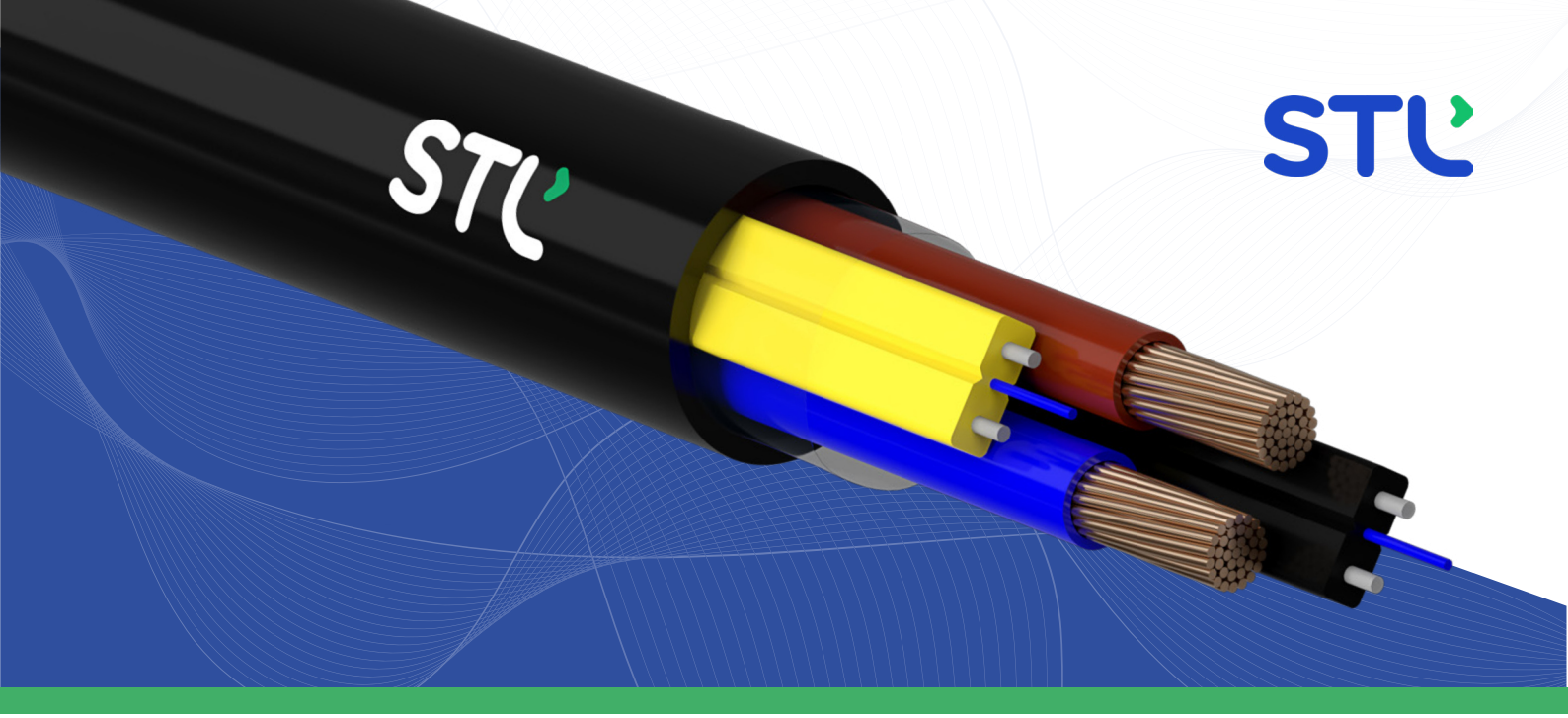

Image 2 : Hybrid Cable 2F SM (3.0 mm x 2.0 mm) and 2 Core X 2.5 sq mm (14AWG)

Hybrid Cable 2F SM (3.0 mm x 2.0 mm) and 2 Core X 2.5 sq mm (14AWG)

Cable Description:

STL's Hybrid Cable 2F SM (3.0 mm x 2.0 mm) and 2 Core X 2.5 sq mm (14AWG) comprises two single mode optical fibres G.657 A2, two power cables with XLPE insulation, two steel wires (SW) for tensile strength. Like the 18 AWG cable, in the 14 AWG cable too, the outer sheath has UV stabilized LSZH for overall protection.

Features:

- 300 N tensile strength
- UV-stabilized LSZH outer sheath
- Bending 10 D
- Operating -20°C to 60°C
- Easy connectorization and compatible with electronics devices

Applications:

- Source Voltage 48 V DC
- Perfect for campus, within buildings, Wifi connectivity, IP connectivity, surveillance, connectivity small cell base stations
- It is used to connect remote sensing devices which use both power as well as data for communication

Power Budget for Remote Powering:

	35 Watt	50 Watt
14 AWG (2.5 SQMM)	227 mtr @ 5% Voltage drop	159 mtr @ 5% Voltage drop
	430 mtr @ 10% Voltage drop	301 mtr @ 10% Voltage drop
	609 mtr @ 15 % Voltage drop	426 mtr @ 15% Voltage drop

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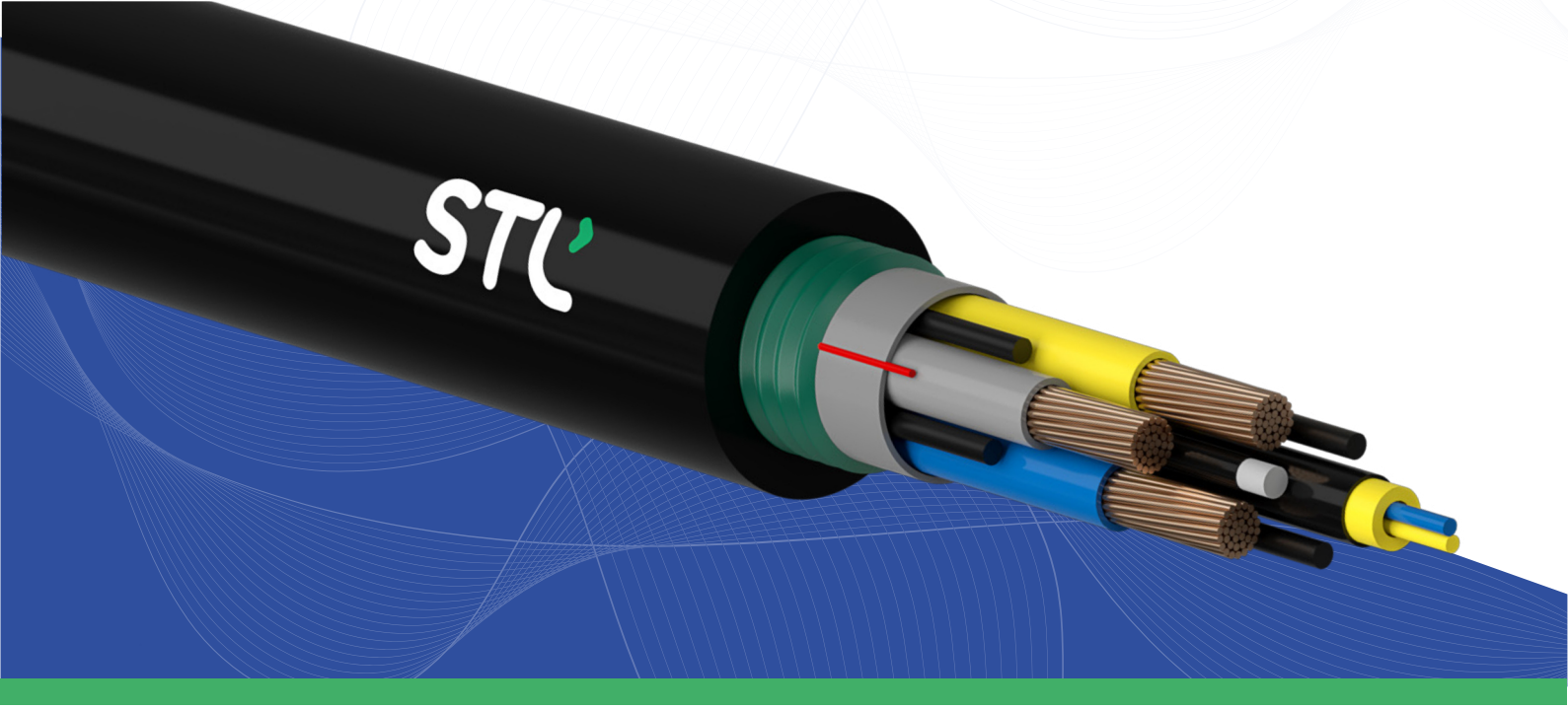

Image 3 : Hybrid Cable 2F and 3 Core x 7/12 AWG

Hybrid Cable 2F and 3 Core x 7/12 AWG

Cable Description:

STL's Hybrid Cable 2F and 3 Core x 7/12 AWG is made of two optical fibres and three copper cables. The cable's core consists of stranded duplex optical fibre and copper conductors. It is ECCS armoured and is covered with a water blocking tape making it sturdy and secure.

Features:

- Conductors sized to provide up to 150/240 V DC/AC
- Various combination of copper conductors and optical fibres in a single composite cable
- Resistant outer jacket available for harsh industrial or outdoor environments
- Gauge sizes of 7 or 12 AWG single-stranded annealed copper available for power
- Available in combinations of all kinds of single mode or multimode optical fibres
- Copper and fibre individually sub-cabled for ease of separation, handling and termination
- UV-protected
- Tightly controlled physical parameters
- Combination of fibre types available on request
- The core consists of stranded duplex optical fibre and copper conductors
- Duplex has two colour coded tight buffered fibres reinforced with aramid yarns which provide protection to fibre

Applications:

- With G fast communications service providers (CSPs) can offer more bandwidth on the line and faster services
- Remote application of low-voltage power
- High Information transmission speed with optical fibre
- FTTA, security networks
- IP-enabled appliances

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Hybrid Cable 48F and 3.5 Core x 35 sq mm

Cable Description:

STL's Hybrid Cable 48F and 3.5 Core x 35 sq mm. Each cable has a 48 fibre single-mode G657A1 and 3.5 core aluminium power cable. The core is protected by a wrapping of binder yarns and water swellable material. Its outer sheath is made of UV-proof black polyethylene.

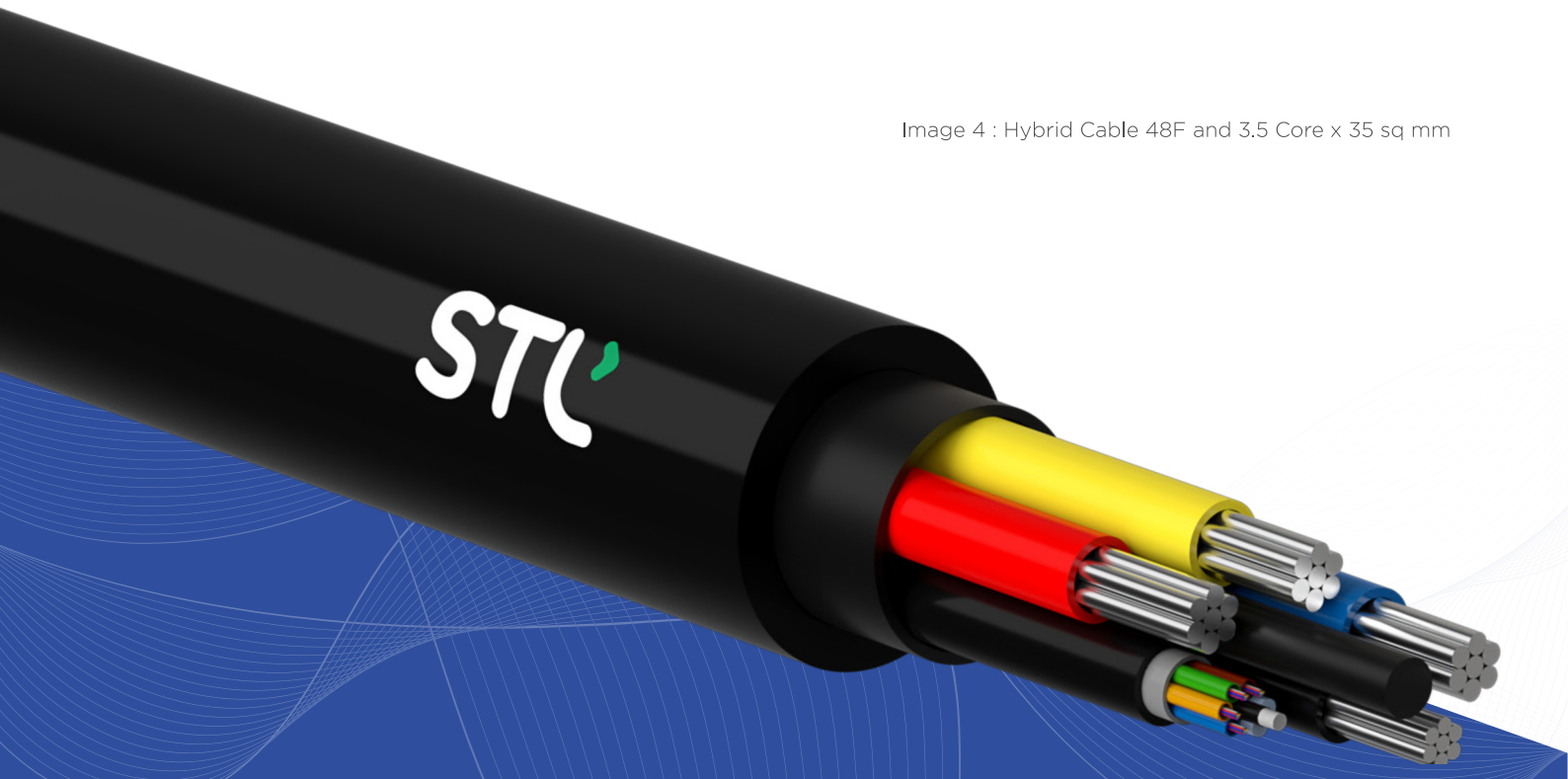
Features:

- UV-proof black polyethylene
- Tensile strength 150 N/mm^2 for power and 2700 N for optical fibre
- 3-Phase A/C power & 48 F under a single sheath
- Operation temp - 30°C to 60°C
- Minimum bending 20D during installation and 15 D after installation
- Voltage rating 1000 V for power cable unit

Applications:

- Tower application
- Data and remote powering

Image 4 : Hybrid Cable 48F and 3.5 Core x 35 sq mm



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Hybrid Cable 12F SM and 3 Core x 10 sq mm

Cable Description:

STL's Hybrid Cable 12F SM and 3 Core x 10 sq mm is made of twelve single-mode G657A1 fibre and three power cables. It has gel-filled thermoplastic loose buffer tube with fibre, is covered with binder tape / yarns and water blocking material, and its outer sheath has UV-Proof black polyethylene for overall protection.

Features:

- Tensile strength 1.5*W or 2000 N
- Cable bend 12D
- Operating temp - 10°C to 85°C
- Moisture barrier
- UV-proof outer sheath
- Single mode optical fibre ITU.T-G657 A1

Applications:

- Low voltage application 48 VDC
- Low voltage feed and fibre connectivity from an existing NGA cabinet to G.Fast plant in the open reach network
- It is required to provide optical network connectivity and a low voltage supply to externally based G.Fast plant / cabinets

Power Budget for Remote Powering:

	50 Watt	100 Watt
8 AWG (10 SQMM)	625 mtr @ 5% voltage drop	317 mtr @ 5% Voltage drop
	1203 mtr @ 10 % Voltage drop	601 mtr @ 10 % Voltage drop
	1704 mtr @ 15% voltage drop	852 mtr @ 15% Voltage drop

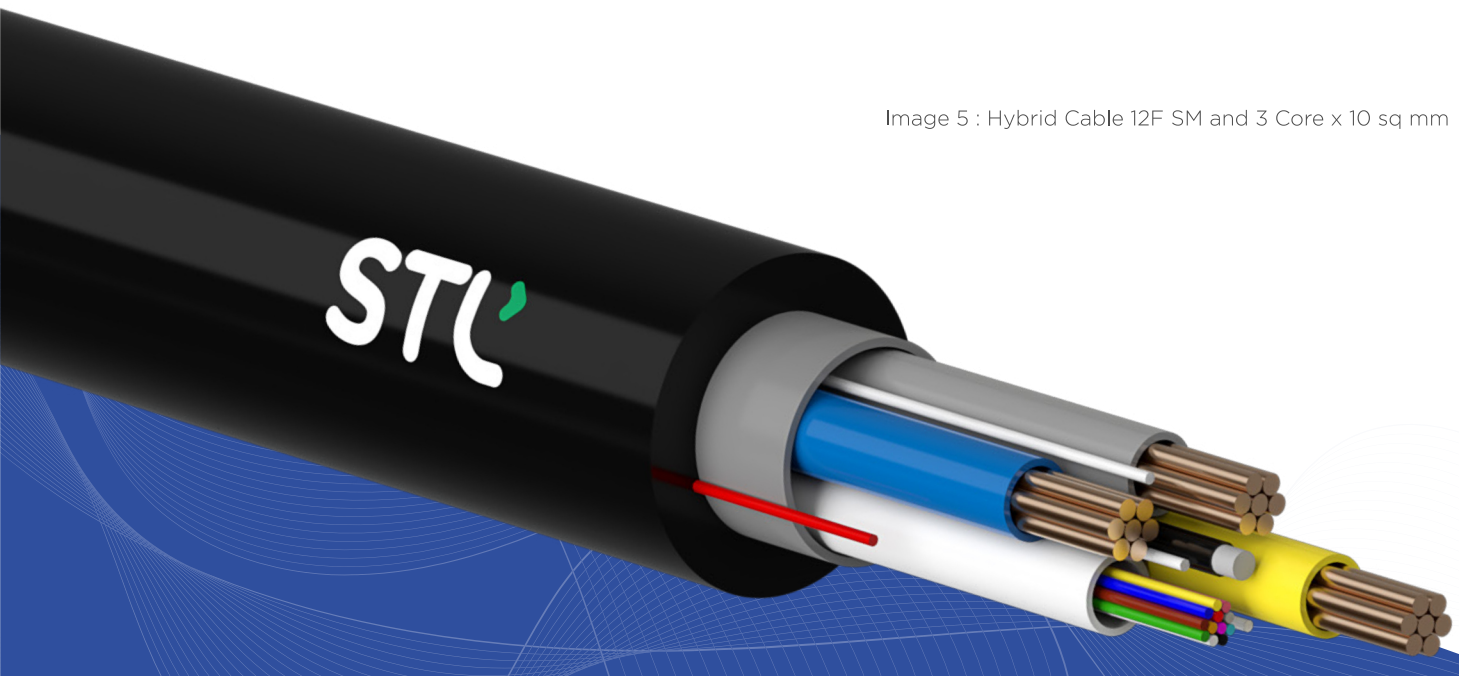

Image 5 : Hybrid Cable 12F SM and 3 Core x 10 sq mm

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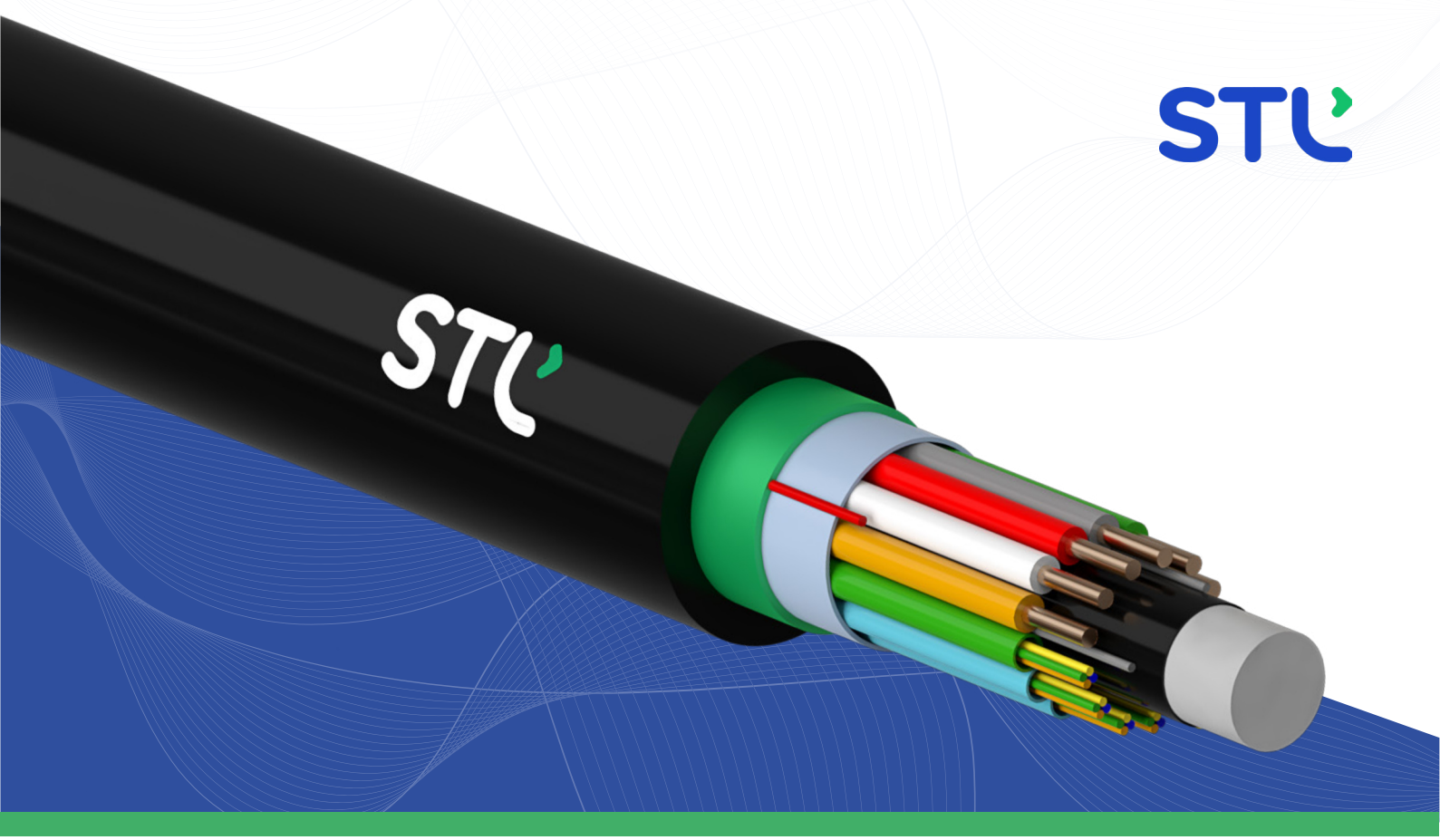

Image 6 : Hybrid Cable 16F MM and 6 Core x 0.6 mm

Hybrid Cable 16F MM and 6 Core x 0.6 mm

Cable Description:

STL's Hybrid Cable 16F MM and 6 Core x 0.6 mm has sixteen multi-mode fibres and six power cable optimal for wavelengths of 850 nm and 1300 nm. The cables have thixotropic gel inside loose tubes to prevent water penetration, and are also protected by binder and water swellable yarns. An outer sheath with UV-proof black polyethylene is for overall protection.

Features:

- Multi-mode (50 /125 µ m) fibre OM3
- Tensile strength 3 x cable weight
- Cable bend 12D
- Moisture barrier
- UV-proof outer sheath
- Operating temp - 10°C to 85°C

Applications:

- These cables are used for transmission system of nominal wavelengths of 850 nm and 1300 nm
- Low voltage application 48 VDC

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Hybrid Cable 24F SM and 6 Core x 0.6 mm

Cable Description:

STL's Hybrid Cable 24F SM and 6 Core x 0.6 mm is made of twelve single-mode G657A1 fibre and three power cables. It has gel-filled thermoplastic loose buffer tube with fibre, is covered with binder tape / yarns and water blocking material, and its outer sheath has UV-Proof black polyethylene for overall protection.

Features:

- Tensile strength 3x cable weight
- Cable bend 12D
- Operating temp - 10°C to 85°C
- Moisture barrier
- UV-proof outer sheath
- Single mode optical fibre ITU.T-G657 A1

Applications:

- These cables are for use in transmission systems operating in the wave-length range of 1260 nm and 1625 nm
- Low voltage application 48 VDC

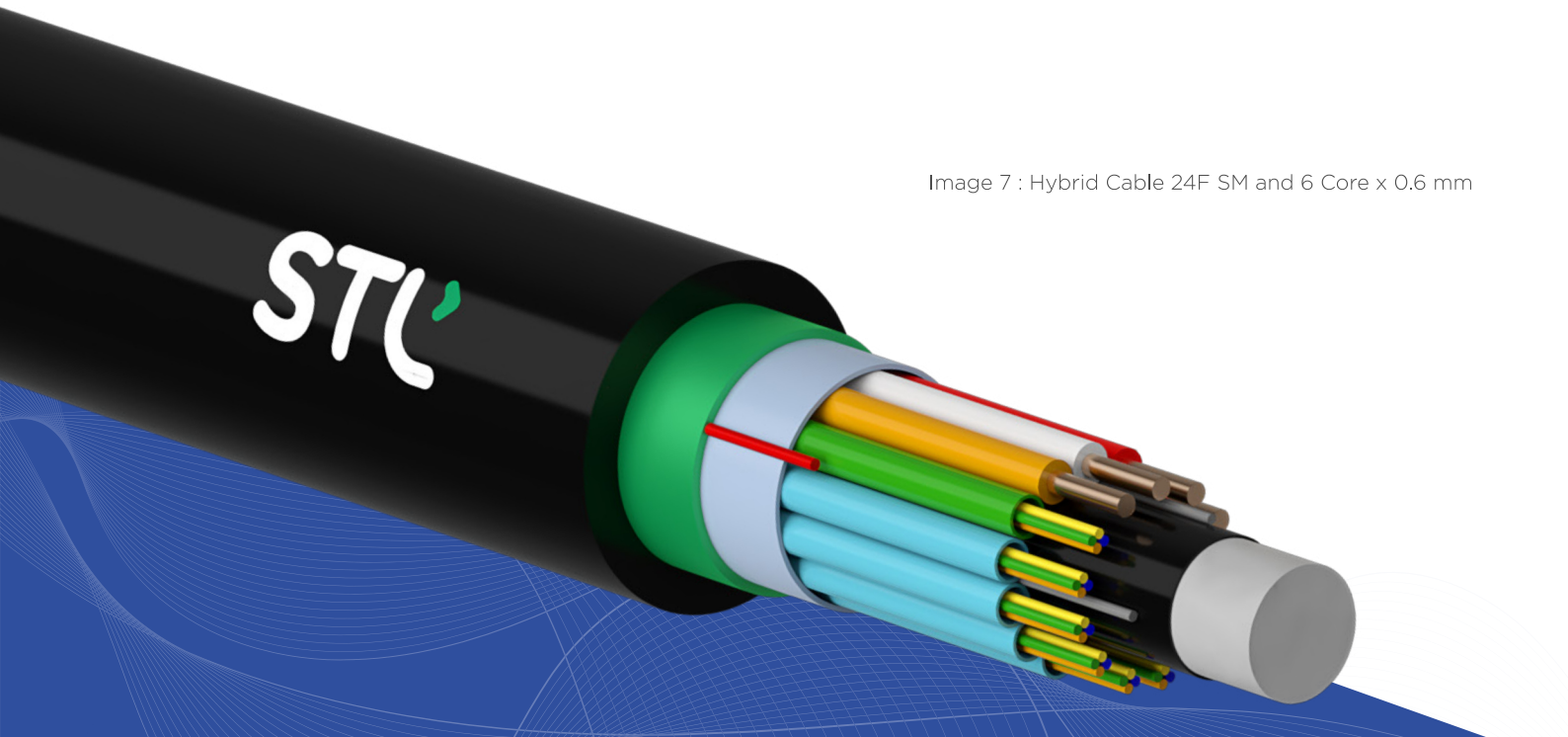

Image 7 : Hybrid Cable 24F SM and 6 Core x 0.6 mm

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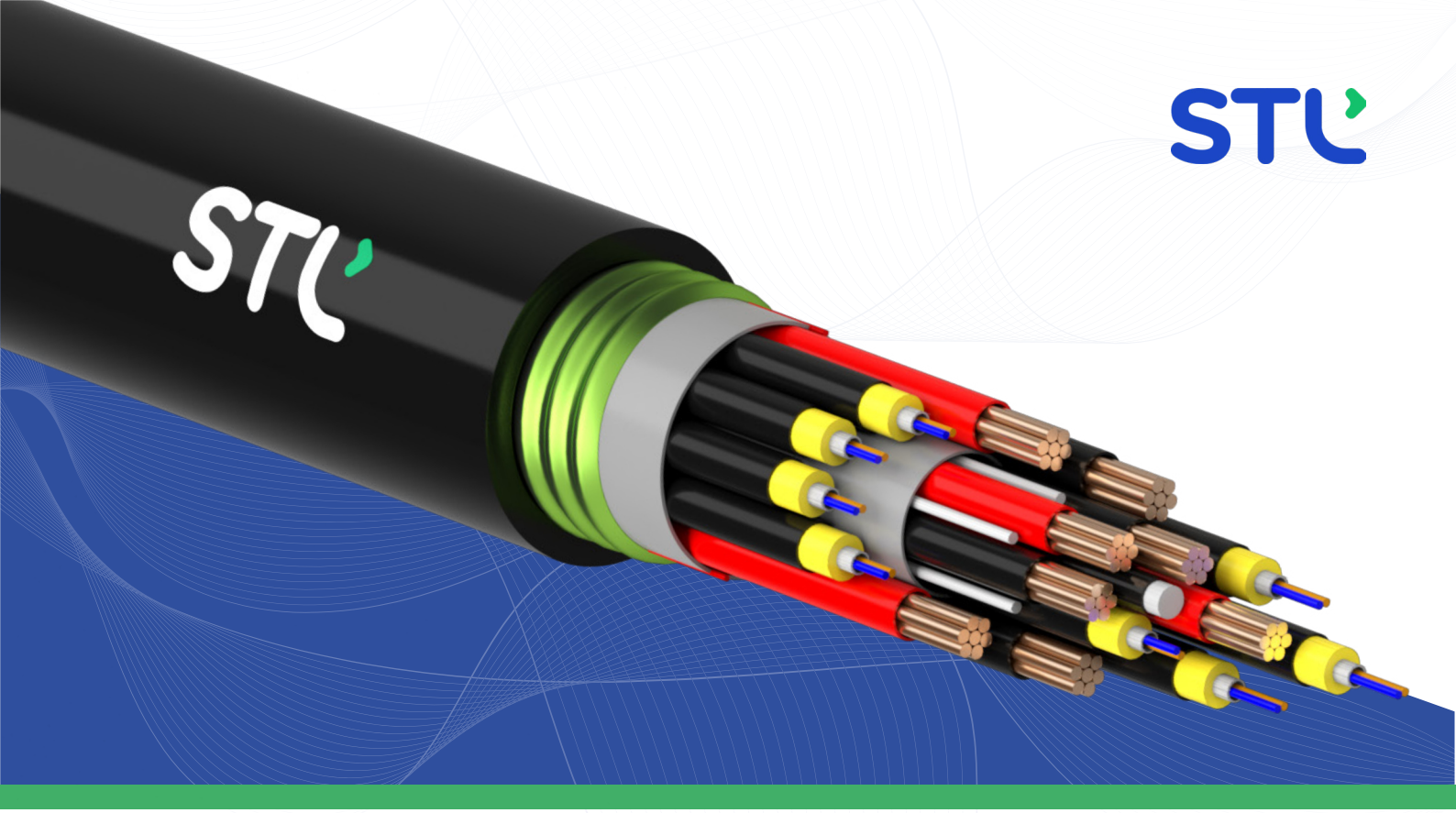

Image 8 : Hybrid Trunk Cable 16 F MM and 8 Core X 10 AWG

Hybrid Trunk Cable 16 F MM and 8 Core X 10 AWG

Cable Description:

STL Hybrid Multitube Single Jacket Fibre Optic Cables are suitable for outdoor fibre-to-the-antenna (FTTA) site deployments by wireless operators. This cable is a stranded loose tube cable with optical fibres placed inside robust buffer tubes. As per the power required, appropriate AWG size copper conductors are stranded around a fibre reinforced plastic (FRP) central strength member. In addition to optical fibres, the buffer tubes contain water-blocking elements and the cable core is surrounded by water-swellable tape to prevent water ingress in the interstices of the cable core. This solution enables power and data transmission without interference over an installation length of over 170 m

Features:

- Compact design consisting of bundle power and fibre cables together in one sheath
- Standardized installation process resulting in reduced cable requirement, installation time, as well as minimizing the need to run multiple cables for every equipment reinforcement
- Supports 8x RRU / AAU total which is split into support of fibre pairs + dc pairs
- Flexible, light weight, easy to handle and install
- UV-protected

Applications:

- FTTA application as Hybrid Trunk cable

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Hybrid Jumper Cable 2F MM/SM and 2 Core X 12 AWG

Cable Description:

STL Hybrid multitube Single Jacket Fibre Optic Cables are suitable as hybrid jumpers, which are connect to either the AAU / RRH or the BBU cabinet. This cable is a stranded loose tube cable with optical fibres placed inside robust buffer tubes. As per the power required, appropriate AWG size copper conductors are stranded around a fibre reinforced plastic (FRP) central strength member. In addition to optical fibres, the buffer tubes contain water blocking elements and the cable core is surrounded by water-swellable tape to prevent water ingress in the interstices of cable core. This solution enables power and data transmission without interference over an installation length of up to 20 m

Features:

- Compact design consisting of bundle power and fibre cables together in one sheath
- Flexible, light weight, easy to handle and install
- Tensile and crush resistant
- UVprotected
- High mechanical strength

Applications:

- FTTA application as Hybrid Jumper Cable

Image 9 : Hybrid Jumper Cable 2F MM/SM and 2 Core X 12 AWG



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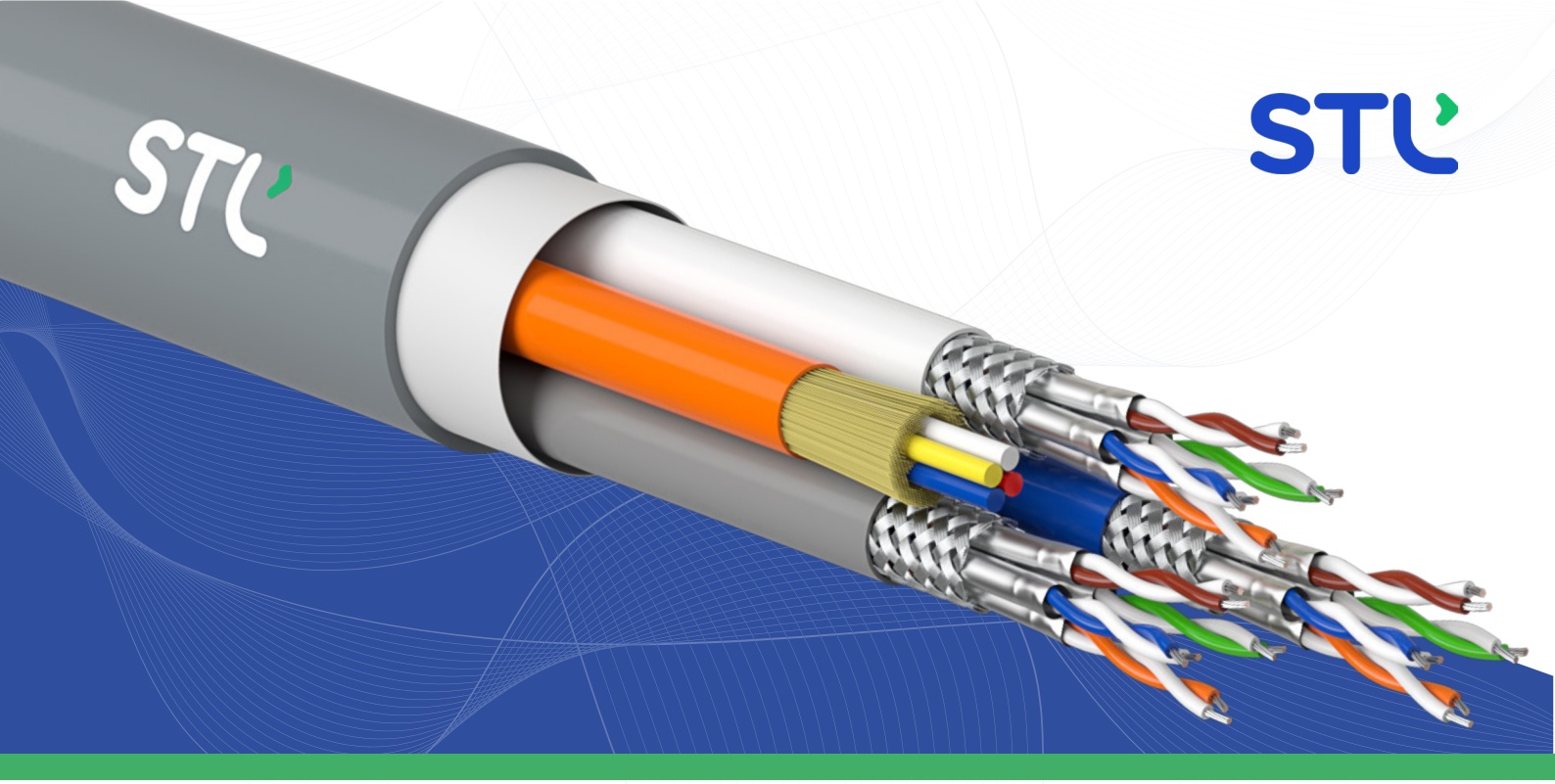

Image 10 : Hybrid Cable S-FTP Cat7A LSZH x 3 and OM4

Hybrid Cable S-FTP Cat7A LSZH x 3 and OM4

Cable Description:

STL's Hybrid Cable S-FTP Cat7A LSZH x 3 and OM4 find their best fit in voice, data, High band communication cable and cable transmission performance of up to 1000 MHz. Each cable is made of three Cat7A S / FTP and four fibres OM4, and insulation foam skin polyolefin for Cat7A. While its core is wrapped with polyester tape for protection, the outer sheath is LSZH made.

Features:

- Dry loose tube
- Standard all data and fibre cable for compact design
- Attenuation: 3.5 dB/km @ 850 nm and 1.5 dB/km @ 1300 nm
- Bending radius 10D
- Tensile strength 500 N
- Operating temp - 20 to 70°C and installation temp 0 to 50°C
- Fire performance - IEC60332-3-24 Cat C
- Smoke density - IEC 61034-2
- Halogen free - IEC60754-2

Applications:

- All ethernet applications which include 10/100/1000 Base T or 1000 Base TX 10G Base-T
- Voice, data, High band communication cable and cable transmission performance is tested up to 1000 MHz complied to ISO IEC 11801:2011 class FA cabling, IEC 61156-5
- Yacht and Ship applications

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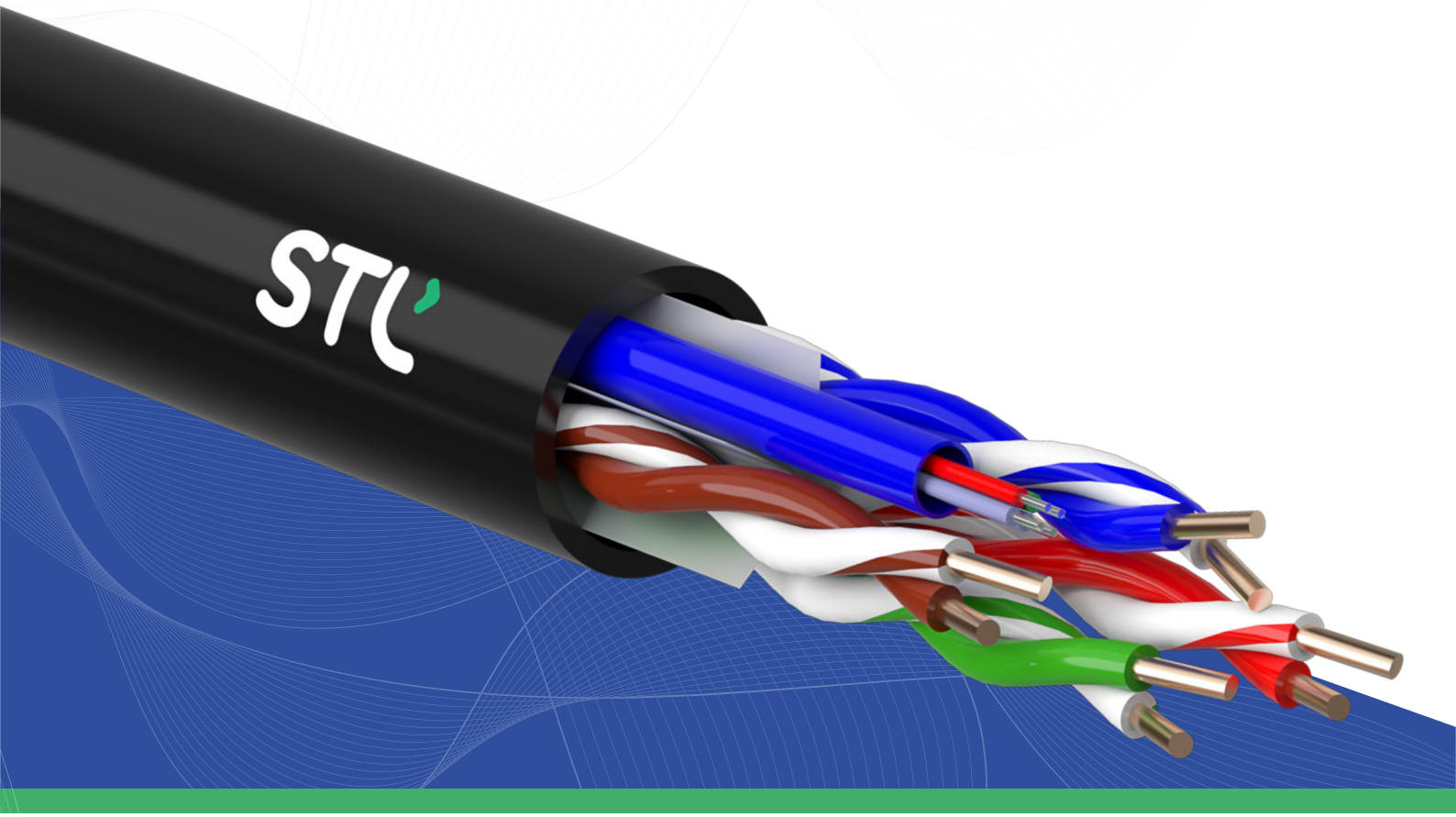

Image 11 : Hybrid Cable Cat6 and 2F SM

Hybrid Cable Cat6 and 2F SM

Cable Description:

STL's Hybrid Cable Cat6 and 2F SM is popular for in-building, surveillance installations. It is made of one Cat6 and 2F SM and two single-mode G657A2 fibre. Its central strength member provides tensile strength, and its outer sheath is made of PVC.

Features:

- Tensile strength 250 N
- Minimum bending radius 20 D during installation and 10 D after installation
- Operating temp - 20°C to 75°C
- Single mode G657 A2

Applications:

- Ethernet, surveillance, in-building
- Backbone Network

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Product Innovation for Outdoor Application

Innovation in Last Mile FTTA – CPRI & eCPRI Cables:

2F Variant for Telecom Ecosystem

STL's 2F variant is a 2F OM2 MM tight buffer, PE-armoured optical fibre cable with aramid yarns distributed over tight buffered fibre as strength member. Water swellable yarns prevent water ingress in the core of cable. The protection is further strengthened by LSZH inner sheath with corrugated ECSS armouring, and the UV-proof black HDPE outer sheath.

Image 12 : 2F Variant for Telecom Ecosystem



24F Variant for Telecom Ecosystem

Cable Description:

The 24F variant is for the Telecom ecosystem. It is available in both single-mode G.652 A1, A2 cables and multi-mode OM2 and OM3 fibres. Like the 2F variant, its inner sheath has the corrugated ECSS tape armouring and the outer sheath, UV-proof HDPE.

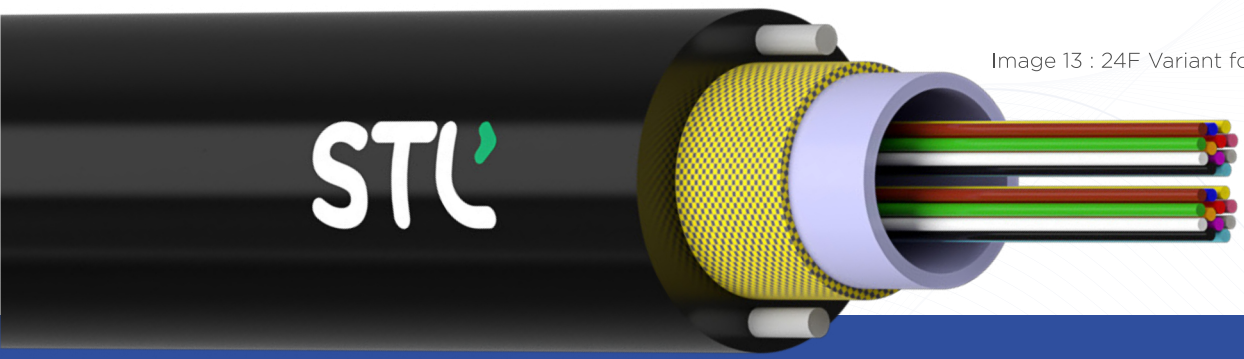
Features:

- Available in both single mode G.652 A1, A2 and multi-mode fibres OM2 and OM3
- Corrugated ECCS tape armouring
- Outer sheath UV-proof HDPE
- Max tensile strength 600 N
- Operating temp - 40°C to 70°C
- Bending 20 D during installation and 10 D after installation

Applications:

- Use for connectivity between BBU (Base Band Unit) to RRU (Remote Radio unit)
- Pre-connectorized options available with MM uni-boot LC connector

Image 13 : 24F Variant for Telecom Ecosystem



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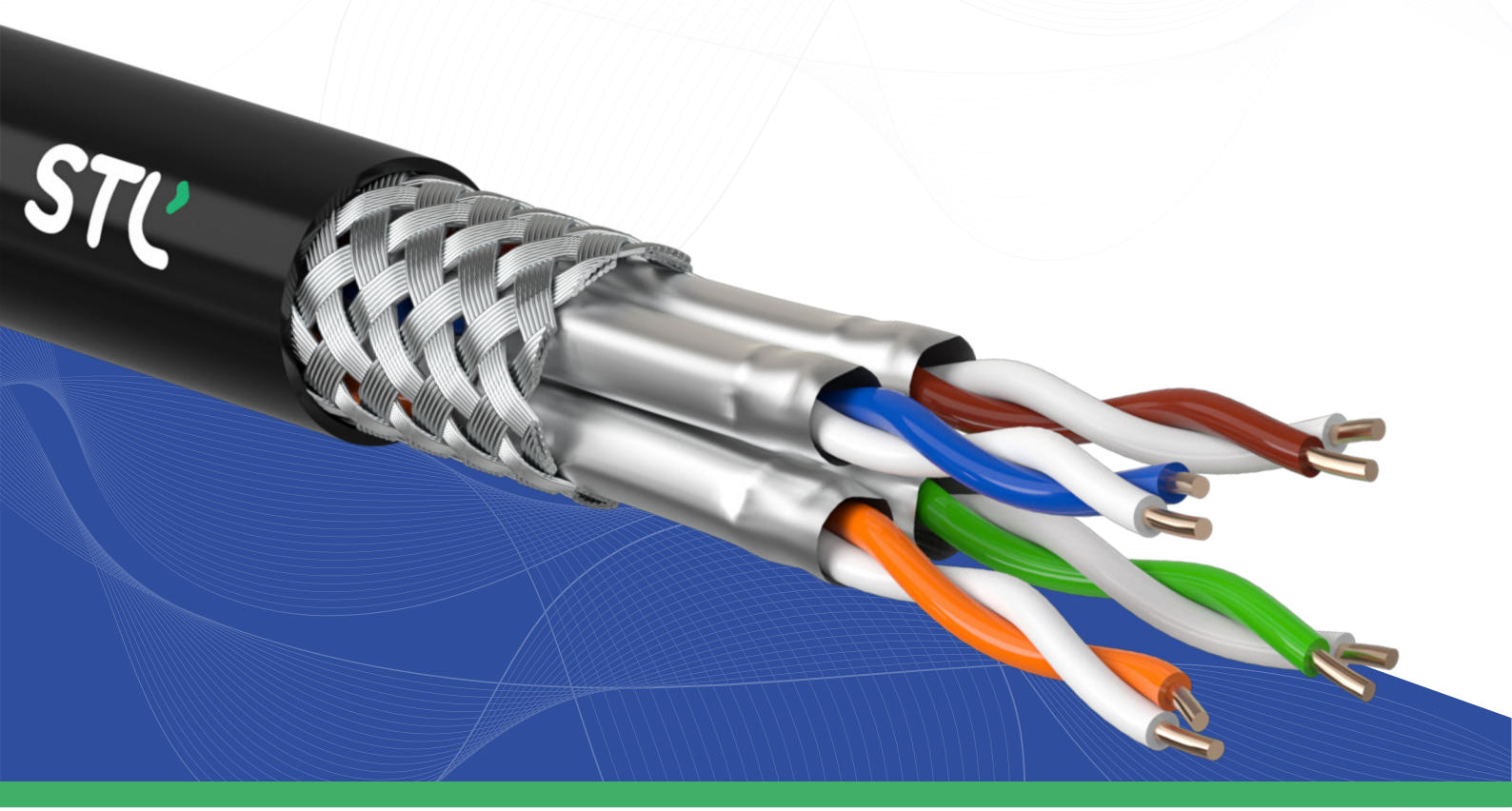

Image 14 : Cat6A S/FTP 4/23 AWG Outdoor - Tower Cable

Cat6A S/FTP 4/23 AWG Outdoor - Tower Cable

Cable Description:

In STL's Cat6A S/FTP 4/23 AWG Outdoor - tower cables, each individual pair is protected with an aluminium / polyester tape shield. Foamed polyethylene provide insulation, and its UV-protected outer jacket makes the cable suitable for outdoor applications.

Features:

- Shield gives protection against electromagnetic interference and avoid signal loss and lower pair to pair crosstalk
- Tinned copper braiding provides mechanical strength to cable
- Tinned copper braiding min. 75 % coverage
- UV-protected outer jacket makes the cable suitable for outdoor application
- Operating temp - 20°C to 70°C
- Bending radius 8D

Applications:

- Enhanced performance cable for transmission of high-speed data, digital and analogue voice and video (RGB) signals on LANs. Supports gigabit ethernet (10GBASE-T) standard. Operates at bandwidth of 500 MHz
- This cable complies with the requirements of ANSI/TIA-568-C.2 and ISO/IEC 11801

Innovation in In-building Connectivity – Duplex Cable:

Cat7A S/FTP Duplex

Cable Description:

STL's duplex Cat7A S/FTP cables best fit transmission performance requirements of up to 1000 MHz. The cables comprise two Cat7A S/FTP, and have foam insulation. Each individual pair has aluminium polyester shield (aluminium outside and polyester inside). With annealed tinned copper braiding, the cables are ZHFR outer sheath protected.

Features:

- Cable transmission performance is tested up to 1000 MHz complied to ISO IEC 11801:2011 Class F Cabling, IEC 61156-5
- LSZH sheath
- 35% minimum braiding coverage
- Duplex construction for easy installation
- Operating temp - 20°C to 70°C
- Bending radius 16 D
- Compatible with all common system according to ISO/IEC 11801:2011, IEC 61156-5
- Individual shield gives higher protection against crosstalk
- Overall shield reduces EMI

Applications:

- All ethernet applications including 10/100/1000Base-T or 1000Base-TX
- 10GBASE-T
- Voice, Data, Wi-fi, DAS



Image 15 : Cat7A S/FTP Duplex

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Notes



About STL-Sterlite Technologies Ltd

STL is an industry-leading Integrator of digital networks.

Our fully 5G ready digital network solutions help telcos, cloud companies, citizen networks, and large enterprises deliver enhanced experiences to their customers. STL provides integrated 5G ready end-to-end solutions ranging from wired to wireless, design to deployment, and connectivity to compute. Our core capabilities lie in Optical Interconnect, Virtualised Access Solutions, Network Software, and System Integration.

We believe in harnessing technology to create a world with next generation connected experiences that transform everyday living. With a global patent portfolio of 582 to our credit, we conduct fundamental research in next-generation network applications at our Centre of Excellence. STL has a strong global presence with next-gen optical preform, fibre, cable, and interconnect subsystem manufacturing facilities in Indie, Italy, China, and Brazil, along with two software-development centers across India and a data centre design facility in the UK.