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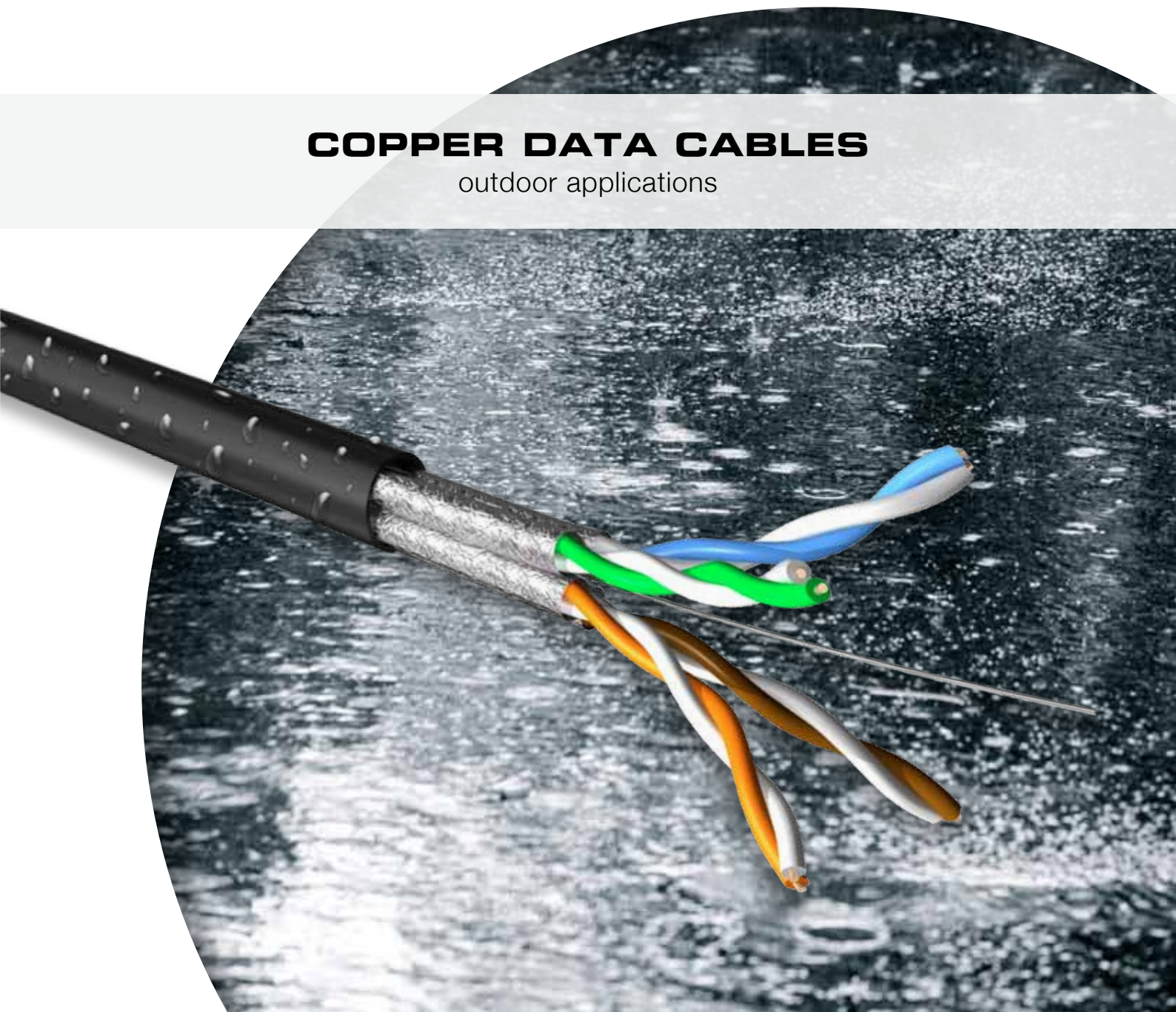
member of the TKH Group <



Smart and simple cabling solutions

## **COPPER DATA CABLES**

outdoor applications





## OUTDOOR APPLICATIONS FOR COPPER DATA CABLES

Twisted pair data cables were not initially designed to be used outdoor. Structured Cabling systems primary objectives were to ensure the transmission of data between computers in office environment where cables are protected. The standard cable outer sheaths, in PVC or LSZH materials, are not adapted to the constraints of outdoor installation.

The rapid development of Ethernet protocols in many areas implies that data cables are now used in non-office environment, and increasingly outdoor.

CCTV, access control or building management systems are now based upon Internet Protocols. These systems include equipment (cameras, sensors, access control panels ...), located outdoor, which have to be connected to the cabling infrastructure. Manufacturing sites, warehouses and all industrial sites are also interconnected with the general data network.

The conditions of installation of data cables in these environments often impose that the cable can resist to water, oil and mechanical stress.

IP Public Address, Video Signage are other applications where data cables can be used in a "non conventional" way and require to withstand outdoor installation conditions.

## MULTIMEDIA CONNECT SOLUTIONS

Multimedia Connect has developed a range of data cables dedicated to outdoor and "industrial" applications. We have selected different designs in order to offer the best performance/cost balance for each application.

### • Indoor/Outdoor Cables - 5254SHINOUT









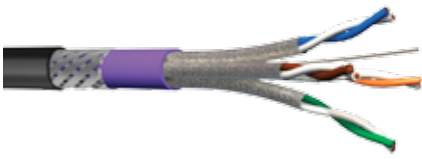

- The special Low Smoke Zero Halogen (LSZH) material used for these cables combines good watertightness, UV resistance and capacity to be installed outdoor and indoor without any restriction.
- It is the perfect cable for all links between the communication room and outdoor equipment CCTV cameras or access control points.
- These cable cannot be direct buried or put in situation of permanent immersion.

### • PE Cables - VG64PE - CX64PE

- Polyethylene is a cost effective compound which ensure a perfect water tightness and an excellent resistance to Ultra Violet rays.
- However, Polyethylene's flame behaviour makes it non compatible with indoor installation. It burns too easily and releases high density fumes. Depending on national regulations only few meters can be installed indoor.

### • PUR Cables - AXCA26653 - 5254SHARPU

- Polyurethane is an expensive but ultra resistant compound
- It is compatible with outdoor and indoor installations
- Resistant to UV, Water, mineral Oils and fats.
- It combines:
  - High resistance to abrasion, tearing and bending strength
  - Very good flexibility at low temperatures
  - Very good thermal stability
- Typically, PUR cables are used in harsh environments such as industrial or marine applications.
- For hard mechanical conditions, these cables exist with steel armoured version.

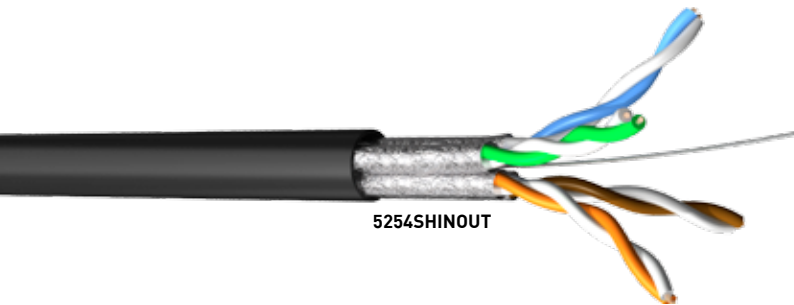
CABLES	CONSTRUCTION	CATEGORY	COST	Applications
5254SHINOUT 	U/FTP LSZH 	CAT6A	***	<ul style="list-style-type: none"> <li>- Outdoor links up to CAT6A performances</li> <li>- Weather-proof</li> <li>- Perfect for IP security applications</li> <li>- High data performance – Good electro magnetic immunity</li> <li>- No direct burial / No Permanent Immersion</li> </ul>
VG64PE 	U/UTP PE 	CAT6	*	<ul style="list-style-type: none"> <li>- All outdoor links up to CAT6</li> <li>- Weather-proof</li> <li>- Not suitable for indoor applications</li> <li>- Good mechanical strength</li> </ul>
CX64PE 	F/UTP PE 	CAT6	**	<ul style="list-style-type: none"> <li>- All outdoor links up to CAT6</li> <li>- Weather-proof</li> <li>- Good mechanical strength</li> <li>- High electromagnetic immunity</li> <li>- Not suitable for indoor applications</li> </ul>
AXCA26653 	S/FTP PUR 	CAT7	****	<ul style="list-style-type: none"> <li>- Industrial and harsh environments indoor and outdoor</li> <li>- High data transmission performances</li> <li>- Excellent electromagnetic immunity BF and HF disturbances.</li> <li>- Very good mechanical and chemical resistance.</li> </ul>
5254SHARPU 	U/FTP PUR 	CAT6A	*****	<ul style="list-style-type: none"> <li>- Industrial and harsh environments – mechanical protection</li> <li>- Indoor and outdoor</li> <li>- Suitable for direct burial</li> </ul>



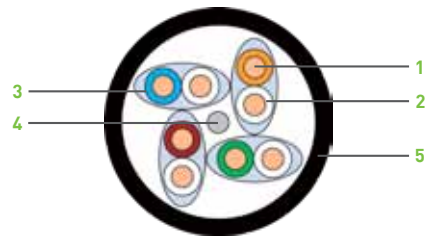
# COPPER CABLES

## CATEGORY 6A CABLES - U/FTP - 525 MHZ

OUTDOOR & INDOOR APPLICATION



5254SHINOUT



1. **Conductor** : Solid bare copper AWG23
2. **Insulation** : PE Skin Foam Skin
3. **Individual shield of pairs** : Aluminium/Polyester foil, coverage  $\geq 100\%$
4. **Drain wire** : Solid tinned copper conductor
5. **Outer sheath** : Special compound : LSZH - Black

### BENEFITS

- Exceed Category 6A standard requirements
- Adapted to outdoor and indoor installation thanks to special LSZH jacket
- UV, ozone resistant and weatherproof
- Not suitable for direct burial



### APPLICATIONS

- ISDN - RNIS
- TOKEN RING 4/16 Mbits - 100 VG-AnyLAN
- TP-PMD/TP-DDI - ATM 155, 622 and 1,2 Gbits
- ETHERNET : 10 Base T, 100 Base Tx, 100 Base T4, 1000 Base T, 10G Base T
- IEEE 802.3 af - PoE
- IEEE 802.3 at - PoEP

### STANDARDS

- CABLE : - IEC 61156-5 - Cat6a
- SYSTEM : - ISO/IEC 11801 Amd 1.0 / Amd 2.0 CLASS Ea  
- EN 50173-1 CLASS Ea  
- TIA 568-C.2 Cat6a
- ENVIRONNEMENT :
  - Resistance to humidity : CEI 20-34
  - Ozone resistance : ASTM D-470
  - UV resistance : IEC 60068-2-5

### TECHNICAL CHARACTERISTICS

- Linear resistance (max.) : 95  $\Omega$  / Km
- Mutual capacity (nom.) : 50 pF / m
- Coupling attenuation (nom) : 65dB
- Characteristic impedance : 100  $\Omega$
- Nominal velocity : 79 %
- Operating temperature : - 20°C / +70°C
- Bending radius (min.) : 8 x cable diameter

### TRANSMISSION PERFORMANCES

FREQUENCY (MHZ)	4	10	16	25	31.25	100	200	250	300	400	500	525
ATTENUATION (dB/100 m)	3.7	5.8	7.3	9.2	10	18.8	27	30	34	39	44.8	45
NEXT (dB)	67	62	59	56	55	47	43	42	40	38	37	36
PSNEXT (dB)	64	59	56	53	52	44	40	39	37	35	34	33
ACR-F (dB/100 m)	66	63	62	57	52	44	35	29	27	26	26	22
PSACR-F (dB/100 m)	63	60	59	54	49	41	32	26	21	23	23	19
RETURN LOSS (dB)	25	27	27	27	25	22	20	19	18	17.8	17.5	17

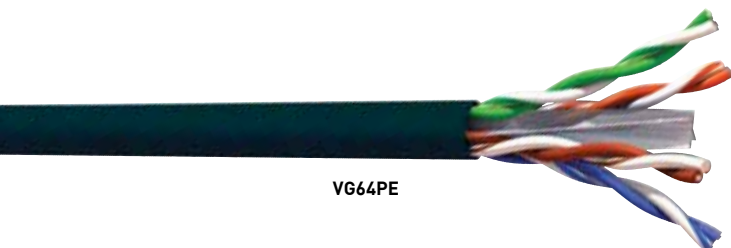
Transmission performances at 20°C

### ORDERING INFORMATION

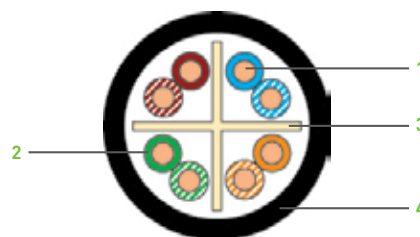
Part number	Pairs	Core section	Shield	Sheath	Outer diameter	Weight	Packaging
5254SHINOUT	4	AWG 23	U/FTP	LSZH	7.3 mm	58 kg/km	500 m

# CATEGORY 6 CABLES - U/UTP - 250 MHZ

## OUTDOOR APPLICATIONS



VG64PE



- 1. **Conductor** : Solid bare copper AWG23
- 2. **Insulation** : PE
- 3. **Central element** : PE cross
- 4. **Outer sheath** : Polyethylene - Black

### BENEFITS

- Adapted to outdoor installation
- Exceed Category 6 standard requirements
- Protection against UV and waterproof
- Adapted to VoIP application
- Not suitable for indoor use



### APPLICATIONS

- RNIS - VoIP
- TOKEN RING 4/16 Mbits - 100 VG-AnyLAN
- TP-PMD/TP-DDI - ATM 155, 622, 1200 Mbits
- ETHERNET : 10 Base T, 100 Base Tx, 100 Base T4, 1000 Base T

### STANDARDS

- CABLE : - IEC 61156-5
- SYSTEM : - ISO/IEC 11801 Edition 2 - CLASS E
- EN 50173-1 CLASS E
- TIA 568-C.2 CAT6

### TECHNICAL CHARACTERISTICS

- Linear resistance (max.) : 95  $\Omega$  / Km
- Mutual capacity (nom.) : 50 pF / m
- Characteristic impedance : 100  $\Omega$
- Nominal velocity : 66 %
- Operating temperature : - 20° C / +70°C
- Bending radius (min.) : 8 x cable diameter

### TRANSMISSION PERFORMANCES

FREQUENCY (MHZ)	4	10	16	25	31.25	62.5	100	200	250
ATTENUATION (dB/100m)	3.5	5.5	6.9	8.7	9.8	13.9	17.5	25.3	28.3
NEXT (dB)	69	63	60	54	55	51	48	44	42
PSNEXT (dB)	66	60	57	51	52	48	45	41	39
ACR-F (dB/100m)	67	60	56	53	51	43	40	34	27
PSACR-F (dB/100m)	64	57	53	50	48	40	37	31	24
RETURN LOSS (dB)	25	28	28	33	27	25	25	24	23

Transmission performances at 20°C

### ORDERING INFORMATION

Part number	Pairs	Core section	Shield	Sheath	Outer diameter	Weight	Packaging
VG64PE	4	AWG 23	Unshielded	PE	6.2 mm	46 kg/km	500 - 1000 m

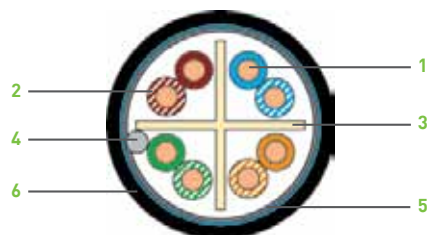
# COPPER CABLES

## CATEGORY 6 CABLE - F/UTP - 350 MHZ

### OUTDOOR APPLICATION



CX64PE



1. **Conductor** : Solid bare copper AWG23
2. **Insulation** : PE
3. **Central element** : PE cross
4. **Drain wire** : Solid tinned copper AWG24
5. **Shield** : Aluminium/Polyester foil, coverage 110%
6. **Outer sheath** : Polyethylene - Black

### BENEFITS

- Adapted to outdoor installation
- Exceed Category 6 standard requirements; tested up to 350MHz
- Protection against UV and waterproof
- Adapted to VoIP application
- Not suitable for indoor use



### APPLICATIONS

- RNIS - VoIP
- TOKEN RING 4/16 Mbits - 100 VG-AnyLAN
- TP-PMD/TP-DDI - ATM 155, 622, 1200 Mbits
- ETHERNET : 10 Base T, 100 Base Tx, 100 Base T4, 1000 Base T
- IEEE 802.3 af - PoE

### STANDARDS

- CABLE : - IEC 61156-5
- SYSTEM : - ISO/IEC 11801 Edition 2 - CLASS E  
- EN 50173-1 CLASS E  
- TIA 568-C.2 CAT6

### TECHNICAL CHARACTERISTICS

- Linear resistance (max.) : 95  $\Omega$  / Km
- Mutual capacity (nom.) : 50 pF / m
- Coupling attenuation (nom.) : 60 dB
- Characteristic impedance : 100  $\Omega$
- Nominal velocity : 66 %
- Operating temperature : - 20° C / +70° C
- Bending radius (min.) : 8 x cable diameter

### TRANSMISSION PERFORMANCES

FREQUENCY (MHZ)	4	10	16	25	31.25	62.5	100	200	250	300	350
ATTENUATION (dB/100 m)	3.5	5.5	6.9	8.1	9.8	13.9	17.5	25.3	28.3	34.2	36.2
NEXT (dB)	69	63	60	61	55	51	48	44	42	45	38
PSNEXT (dB)	66	60	57	58	52	48	45	41	39	42	35
ACR-F (dB/100m)	67	60	56	53	51	43	40	34	27	25	22
PSACR-F (dB/100m)	64	57	53	50	48	40	37	31	24	22	19
RETURN LOSS (dB)	25	28	28	35	27	25	25	24	23	28	21

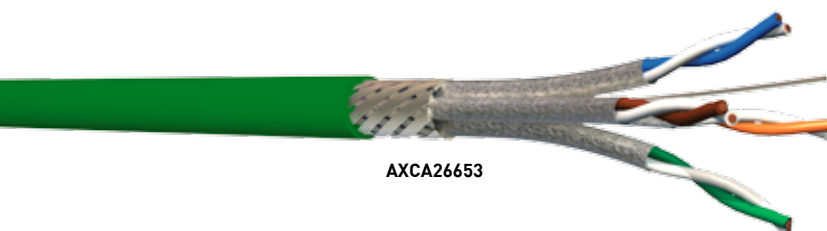
Transmission performances at 20°C

### ORDERING INFORMATION

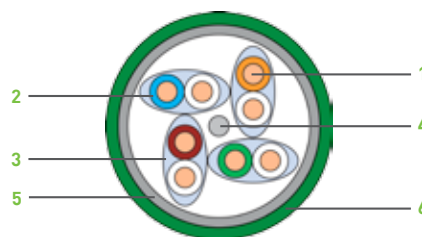
Part number	Pairs	Core section	Shield	Sheath	Outer diameter	Weight	Packaging
CX64PE	4	AWG 23	F/UTP	PE	7.1 mm	53 kg/km	500 - 1000 m

# CATEGORY 7 CABLES - S/FTP - 600 MHZ

## HARSH ENVIRONMENTS



AXCA26653



1. **Conductor** : Solid bare copper AWG23
2. **Insulation** : Polyolefin cellular
3. **Pair individual shield** : Aluminium/Polyester - Coverage > 100%
4. **Drain wire** : Solid tinned copper
5. **General shield** : Tinned copper Braid
6. **Outer jacket** : Polyurethan - Green

### BENEFITS

- Industrial and harsh environments indoor and outdoor
- High data transmission performances
- Excellent electromagnetic immunity BF and HF disturbances.
- Very good mechanical and chemical resistance.
- Adapted to VoIP and PoE application



### APPLICATIONS

- RNIS - VoIP
- TOKEN RING 4/16 Mbits - 100 VG-AnyLAN
- TP-PMD/TP-DDI - ATM 155, 622, 1200 Mbits
- ETHERNET : 10 Base T, 100 Base Tx, 100 Base T4, 1000 Base T, Gigabit Ethernet, 10G Base T
- IEEE 802.3 af - PoE
- IEEE 802.3 at - PoEP

### STANDARDS

- CABLE : - IEC 61156-5 Cat 7
- SYSTEM : - ISO/IEC 11801 Amd 1.0 / Amd 2.0 - CLASS F
- EN 50173-1 CLASS F
- EIA/TIA 568-C.2

### TECHNICAL CHARACTERISTICS

- Linear resistance (max.) : 73  $\Omega$  / Km
- Mutual capacity (nom.) : 45 pF / 100 m
- Coupling attenuation (nom) : 60 dB
- Characteristic impedance : 100  $\Omega$
- Nominal velocity : 78 %
- Operating temperature : - 45°C / +65°C
- Bending radius (min.) : 8 x cable diameter
- Fire behaviour : IEC 60332-1

### TRANSMISSION PERFORMANCES

FREQUENCY (MHZ)	1	10	16	20	31.25	62.5	100	200	300	600
ATTENUATION (dB/100 m)	2	5.6	6.9	7.9	9.8	13.9	18	26	32.5	47.6
NEXT (dB)	90	90	90	88	88	88	88	82	79	75
PSNEXT (dB)	87	87	87	85	85	85	85	79	76	72
ACR-F (dB/100 m)	98	89	86	83	79	72	69	63	55	48
PSACR-F (dB/100 m)	95	86	83	80	76	69	66	60	52	45
RETURN LOSS (dB)	22	25	28	28	27	24	22	21	19	19

Transmission performances at 20°C

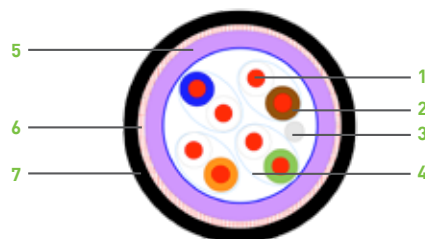
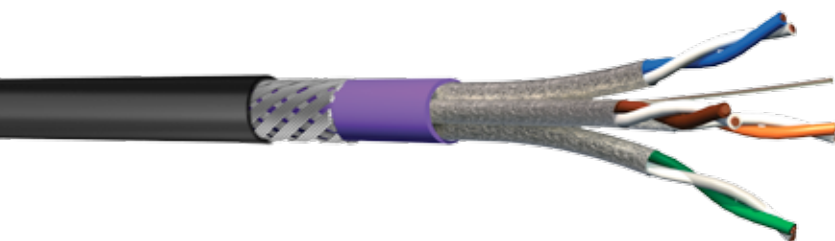
### ORDERING INFORMATION

Part number	Pairs	Core section	Shield	Sheath	Nominal outer diameter	Weight	Packaging
AXCA26653	4	AWG 23	S/FTP	PUR	7,6 mm	60 kg/km	1000 m

# COPPER CABLES

## CATEGORY 6A CABLES - U/FTP - 525 MHZ

HARSH ENVIRONMENTS - DIRECT BURIAL



1. **Conductor** : Solid bare copper AWG23
2. **Insulation** : PE Skin Foam Skin
3. **Drain wire** : Solid tinned copper
4. **Individual pair shield** : Aluminium/Polyester foil  
Alu towards out - coverage: 110%
5. **Inner sheath** : LSZH Violet RAL 4001
6. **Armour** : Galvanized steel braid
7. **Outer Sheath** : Polyurethane - black

### BENEFITS

- Exceed Cat 6A standard requirements tested up to 525 Mhz
- Adapted to VoIP and POE application
- Industrial and harsh environments mechanical protection
- Indoor and outdoor
- Suitable for direct burial



### APPLICATIONS

- ISDN - RNIS
- TOKEN RING 4/16 Mbits - 100 VG-AnyLAN
- TP-PMD/TP-DDI - ATM 155, 622 and 1,2 Gbits
- ETHERNET : 10 Base T, 100 Base Tx, 100 Base T4, 1000 Base T, 10G Base T
- IEEE 802.3 af - PoE
- IEEE 802.3 at - PoEP

### STANDARDS

- CABLE : - IEC 61156-5 Cat 6a
- SYSTEM : - ISO/IEC 11801 CLASS Ea

### TECHNICAL CHARACTERISTICS

- Linear resistance (max.) : 95  $\Omega$  / Km
- Mutual capacity (nom.) : 42 pF / m
- Coupling attenuation (nom.) : 65dB
- Characteristic impedance : 100  $\Omega$
- Nominal velocity : 79 %
- Operating temperature : - 20°C / +70°C
- Bending radius (min.) : 8 x cable diameter
- Fire behaviour : IEC 60332-1

### TRANSMISSION PERFORMANCES

FREQUENCY (MHZ)	1	4	10	16	25	31.25	100	200	250	300	400	500	525
ATTENUATION (dB/100 m)	1.8	2.9	4.6	6.1	8.6	9.1	17.3	25.5	30.5	33.6	38	42.5	45
NEXT (dB)	90	88	86	85	84	83	80	78	75	74	72	72	68
PSNEXT (dB)	87	85	83	82	81	80	77	75	72	71	69	69	66
ACR-F (dB/100m)	87	86	83	82	77	72	64	55	49	47	46	46	42
PSACR-F (dB/100m)	84	83	80	79	74	69	61	52	46	44	43	43	38
RETURN LOSS (dB)	36	35	35	35	35	34	33	32	31	28	24	22	21

Transmission performances at 20°C

### ORDERING INFORMATION

Part number	Pairs	Core section	Shield	Sheath	Outer diameter	Packaging
5254SHARPU	4	AWG 23	U/FTP	PUR	10,3 mm	1000 m