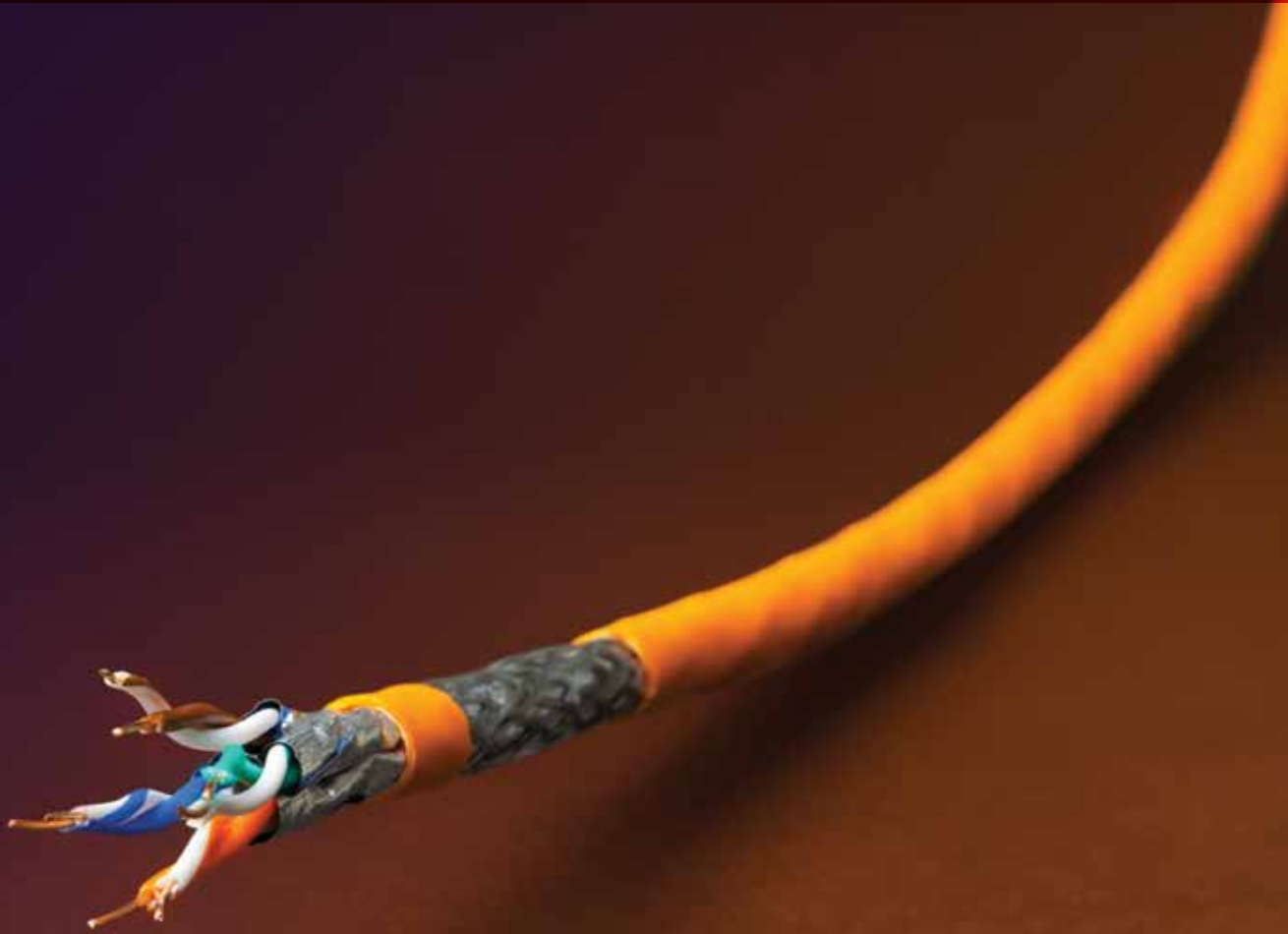


CABLE CATALOGUE



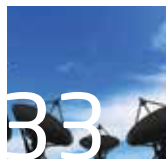
 **REÇBER**



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Vision

To be recognized worldwide as a high quality cable manufacturer and developer offering the most appropriate coaxial cable solutions to our clients while ensuring the development of the company through reasonable profits.

Mission

To fulfill customer satisfaction by continuously improving the products and standards to ensure long term growth while providing the highest service from our dedicated staff and applying a cost effective production system.

DATA

Cables





TECHNOLOGY

TECHNOLOGY



SL200 U24

Data cable , Category 5e

U/UTP, Class D, 100MHz

4x2xAWG24

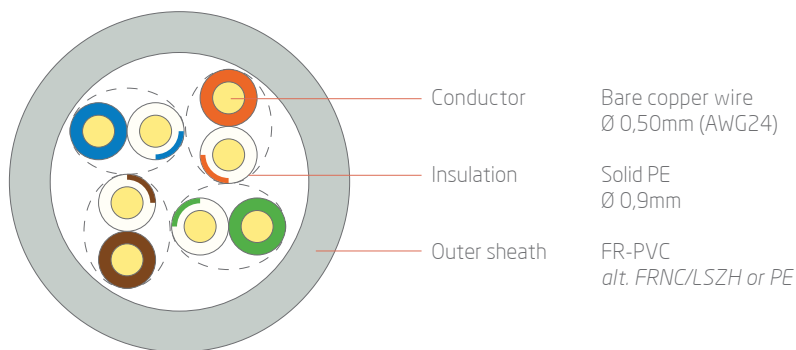


Types
SL200 U24 PVC
SL200 U24 LSZH
SL200 U24 PE

PRODUCT INFORMATION

Cable constructions

SL200 U24



Features and applications

Recber SL200 U24 is premium grade Class D data cable for building structured premises cabling, to support Ethernet protocol for installation in horizontal and backbone areas. They are characterized by large performance reserves and outstanding quality.

Suitable for applications up to Class D (100MHz) 1GbE acc.to IEEE 802.3 ab, VoIP, Power over Ethernet (PoE)/PoE+, transmission of digital and analogue signals, voice, video and data applications. Services such as Ethernet 10 Base-T, Fast Ethernet 100 Base-T, ATM155, FDDI, token ring 4/16 Mbit/s or ISDN.

Standards

- International standard ISO/IEC 11801 2nd ed., IEC 61156-5
- European standard EN 50173-1, EN 50288-3-1
- U.S. Standards ANSI EIA/TIA 568-C.2

Flame resistancy

- Flame retardancy IEC 60332-1-2 (FR-PVC, FRNC/LSZH)
- Halogen free IEC 60754-1/2 (FRNC/LSZH)
- Smoke density IEC 61034-1/2 (FRNC/LSZH)



Low Voltage Directive 2006/95/EC
EC Directive 2011/65/EU

SL200 U24

Data cable , Category 5e

U/UTP, Class D, 100MHz

4x2xAWG24

Electrical characteristics (HF) at 20 °C

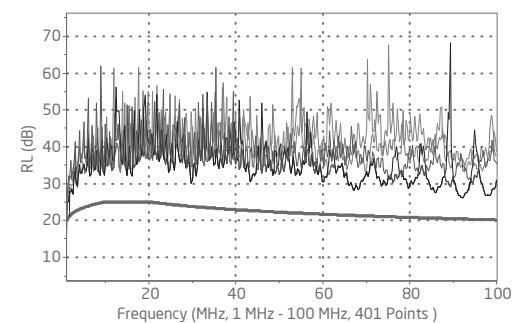
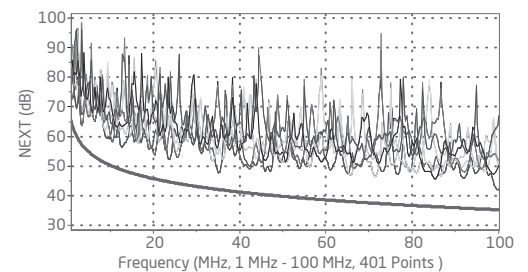
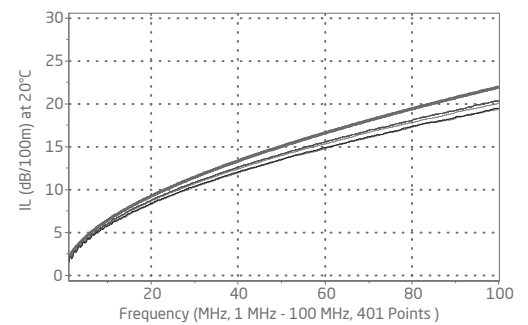
Frequency [MHz]	Attenuation [dB/100m]		NEXT [dB]		PS-NEXT [dB]		ACR [dB/100m]		PS-ACR [dB/100m]		ACR-F [dB/100m]		PS-ACR-F [dB/100m]		RL [dB]	
	typ.	max.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.
1	1,9	2,1	71	65,3	68	62,3	69	63,2	66	60,2	82	63,8	79	60,8	23	20
4	3,6	4	62	56,3	59	53,3	58	52,3	55	49,3	70	51,8	67	48,8	33	23
10	5,5	6,3	56	50,3	53	47,3	51	44	48	41	55	43,8	52	40,8	31	25
16	7,7	8	54	47,2	51	44,2	46	39,2	43	36,2	48	39,7	45	36,7	32	25
31,25	11,3	11,4	50	42,9	47	39,9	39	31,5	36	28,5	40	33,9	37	30,9	32	23,6
62,50	16,2	16,5	45	38,4	42	35,4	29	21,8	26	18,8	37	27,9	34	24,9	29	21,5
100	21	21,3	42	35,3	39	32,3	21	14	18	11	30	23,8	27	20,8	27	20,1
200	27,5	-	36	-	33	-	9	-	6	-	22	-	19	-	19	-

Electrical characteristics (LF) at 20 °C

- DC resistance **max.** 95 Ω/km
- Resistance unbalance **max.** 2 %
- Insulation resistance **min.** 2 G Ω x km
- Mutual capacitance **nom.** 48 pF/m
- Capacitance unbalance **max.** 1500 pF/km
- Characteristic impedance **@ 100MHz** 100 ± 5 Ω
- Coupling attenuation **min.** 40 dB (Type 1)
- Velocity of propagation **approx.** 67 %
- Propagation delay **nom.** 535 ns/100 m
- Skew at 100MHz **nom.** 20 ns/100 m
- Testing voltage 1000 V
- Operating voltage **max.** 125 V

Mechanical characteristics

- Bending radius during installation **min.** 8 x D
- Bending radius as installed **min.** 4 x D
- Tensile strength **max.** 100 N
- Crush resistance **min.** 1000 N/10cm
- Impact strength **min.** 10 impacts
- Temperature range installation **0 °C to +50 °C**
- Temperature range in operation **-20 °C to +60 °C (FR-PVC /LSZH)**
-40 °C to +80 °C (PE)



Part no.	Dimensions	Outer dia. approx.[mm]	Cu content [kg/km]	Cable weight [kg/km]	Fire load [MJ/m] [kWh/m]	Sheath - Color	Packing [m]
505001	4 x 2 x 0,50	5,0	15	31	0,36 0,10	FR-PVC ¹⁾ (RAL 7035)	305/500/1000
505004	4 x 2 x 0,50	5,0	15	32	0,33 0,09	FRNC/LSZH ²⁾ (RAL 1021)	500/1000
505007	4 x 2 x 0,50	5,0	15	27	0,55 0,15	PE ³⁾ (RAL 9011)	500/1000

¹⁾ FR-PVC=Flame Retardant Polyvinyl Chloride

²⁾ FRNC/LSZH=Flame Retardant Non Corrosive / Low Smoke Zero Halogen

³⁾ PE=Polyethylene

SL200 F/U24

Data cable , Category 5e

F/UTP, Class D , 100MHz

4x2xAWG24

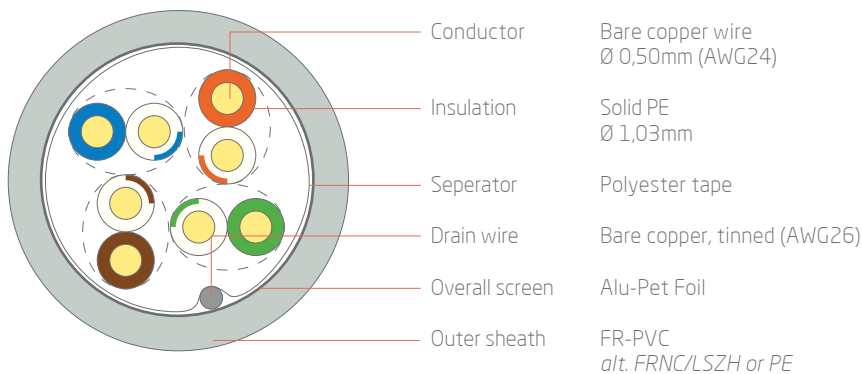


Types
SL200 F/U24 PVC
SL200 F/U24 LSZH
SL200 F/U24 PE

PRODUCT INFORMATION

Cable constructions

SL200 F/U24



Features and applications

Recber SL200 F/U24 is premium grade Class D data cable for building structured premises cabling, to support Ethernet protocol for installation in horizontal and backbone areas. They are characterized by large performance reserves and outstanding quality. It has excellent shielding efficiency due to overall foil screen.

Suitable for applications up to Class D (100MHz) 1GbE acc.to IEEE 802.3 ab, VoIP, Power over Ethernet (PoE)/PoE+, transmission of digital and analogue signals, voice, video and data applications. Services such as Ethernet 10 Base-T, Fast Ethernet 100 Base-T, ATM155, FDDI, token ring 4/16 Mbit/s or ISDN.

Standards

- International standard ISO/IEC 11801 2nd ed., IEC 61156-5
- European standard EN 50173-1, EN 50288-2-1
- U.S. Standards ANSI EIA/TIA 568-C.2

Flame resistancy

- Flame retardancy IEC 60332-1-2 (FR-PVC, FRNC/LSZH)
- Halogen free IEC 60754-1/2 (FRNC/LSZH)
- Smoke density IEC 61034-1/2 (FRNC/LSZH)



Low Voltage Directive 2006/95/EC
EC Directive 2011/65/EU

SL200 F/U24

Data cable , Category 5e

F/UTP, Class D, 100MHz

4x2xAWG24

Electrical characteristics (HF) at 20 °C

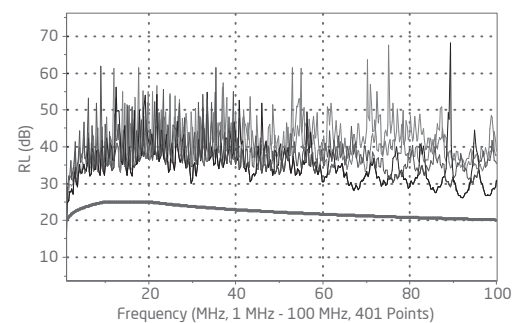
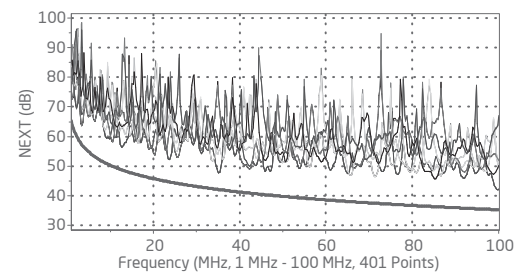
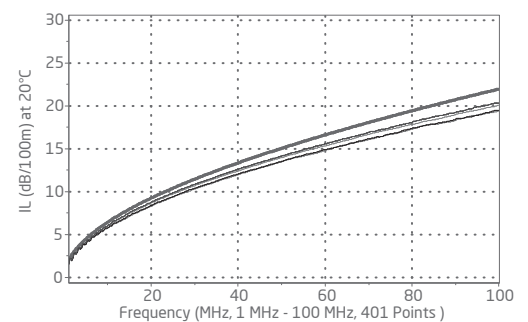
Frequency [MHz]	Attenuation [dB/100m]		NEXT [dB]		PS-NEXT [dB]		ACR [dB/100m]		PS-ACR [dB/100m]		ACR-F [dB/100m]		PS-ACR-F [dB/100m]		RL [dB]	
	typ.	max.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.
1	1,9	2,1	71	65,3	68	62,3	69	63,2	66	60,2	82	63,8	79	60,8	23	20
4	3,6	4	62	56,3	59	53,3	58	52,3	55	49,3	70	51,8	67	48,8	33	23
10	5,5	6,3	56	50,3	53	47,3	51	44	48	41	55	43,8	52	40,8	31	25
16	7,7	8	54	47,2	51	44,2	46	39,2	43	36,2	48	39,7	45	36,7	32	25
31,25	11,3	11,4	50	42,9	47	39,9	39	31,5	36	28,5	40	33,9	37	30,9	32	23,6
62,50	16,2	16,5	45	38,4	42	35,4	29	21,8	26	18,8	37	27,9	34	24,9	29	21,5
100	21	21,3	42	35,3	39	32,3	21	14	18	11	30	23,8	27	20,8	27	20,1
200	27,5	-	36	-	33	-	9	-	6	-	22	-	19	-	19	-

Electrical characteristics (LF) at 20 °C

- DC resistance **max.** 95 Ω/km
- Resistance unbalance **max.** 2 %
- Insulation resistance **min.** 2 G Ω x km
- Mutual capacitance **nom.** 48 pF/m
- Capacitance unbalance **max.** 1500 pF/km
- Characteristic impedance **@ 100MHz** 100 ± 5 Ω
- Transfer impedance **@ 1/10/30MHz** 50/100/200 mΩ/m
- Coupling attenuation **min.** 55 dB
- Velocity of propagation **approx.** 67 %
- Propagation delay **nom.** 535 ns/100 m
- Skew at 100MHz **nom.** 20 ns/100 m
- Testing voltage **nom.** 1000 V
- Operating voltage **max.** 125 V

Mechanical characteristics

- Bending radius during installation **min.** 8 x D
- as installed **min.** 4 x D
- Tensile strength **max.** 80 N
- Crush resistance **min.** 1000 N/10cm
- Impact strength **min.** 10 impacts
- Temperature range installation **0 °C to +50 °C**
- in operation **-20 °C to +60 °C (FR-PVC / LSZH)**
-40 °C to +80 °C (PE)



Part no.	Dimensions	Outer dia. approx.[mm]	Cu content [kg/km]	Cable weight [kg/km]	Fire load [MJ/m] [kWh/m]	Sheath - Color	Packing [m]
505002	4 x 2 x 0,50	6,0	15	41	0,43 0,12	FR-PVC ¹⁾ (RAL 7035)	500/1000
505005	4 x 2 x 0,50	6,0	15	42	0,39 0,11	FRNC/LSZH ²⁾ (RAL 1021)	500/1000
505008	4 x 2 x 0,50	6,0	15	34	0,62 0,17	PE ³⁾ (RAL 9011)	500/1000

¹⁾FR-PVC=Flame Reterdant Polyvinyl Chloride

²⁾FRNC/LSZH=Flame Reterdant Non Corrosive / Low Smoke Zero Halogen

³⁾PE=Polyethylene

SL200 SF/U24

Data cable , Category 5e

SF/UTP, Class D, 100MHz

4x2xAWG24

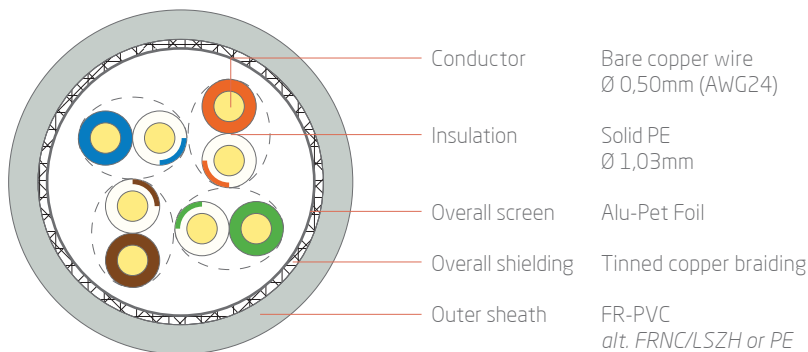


Types
SL200 SF/U24 PVC
SL200 SF/U24 LSZH
SL200 SF/U24 PE

PRODUCT INFORMATION

Cable constructions

SL200 SF/U24



Features and applications

Recber SL200 SF/U24 is premium grade Class D data cable for building structured premises cabling, to support Ethernet protocol for installation in horizontal and backbone areas. They are characterized by large performance reserves and outstanding quality. It has excellent shielding efficiency due to overall foil screen and tinned copper braiding.

Suitable for applications up to Class D (100MHz) 1GbE acc.to IEEE 802.3 ab, VoIP, Power over Ethernet (PoE)/PoE+, transmission of digital and analogue signals, voice, video and data applications. Services such as Ethernet 10 Base-T, Fast Ethernet 100 Base-T, ATM155, FDDI, token ring 4/16 Mbit/s or ISDN.

Standards

- International standard ISO/IEC 11801 2nd ed., IEC 61156-5
- European standard EN 50173-1, EN 50288-2-1
- U.S. Standards ANSI EIA/TIA 568-C.2

Flame resistancy

- Flame retardancy IEC 60332-1-2 (FR-PVC, FRNC/LSZH)
- Halogen free IEC 60754-1/2 (FRNC/LSZH)
- Smoke density IEC 61034-1/2 (FRNC/LSZH)



Low Voltage Directive 2006/95/EC
EC Directive 2011/65/EU

SL200 SF/U24

Data cable , Category 5e

SF/UTP, Class D, 100MHz

4x2xAWG24

Electrical characteristics (HF) at 20 °C

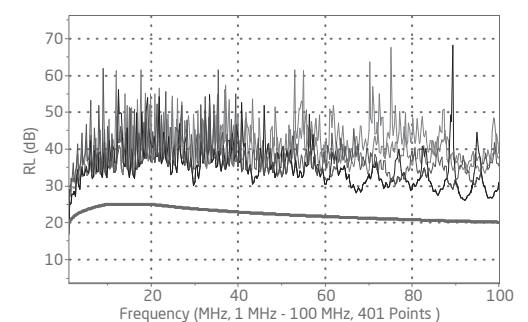
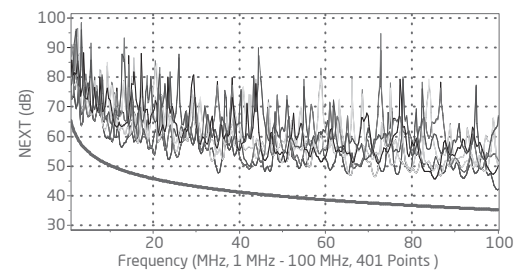
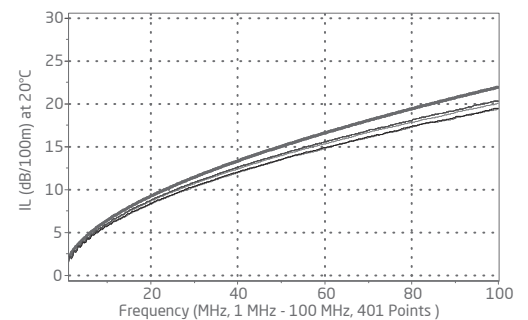
Frequency [MHz]	Attenuation [dB/100m]		NEXT [dB]		PS-NEXT [dB]		ACR [dB/100m]		PS-ACR [dB/100m]		ACR-F [dB/100m]		PS-ACR-F [dB/100m]		RL [dB]	
	typ.	max.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.
1	1,9	2,1	71	65,3	68	62,3	69	63,2	66	60,2	82	63,8	79	60,8	23	20
4	3,6	4	62	56,3	59	53,3	58	52,3	55	49,3	70	51,8	67	48,8	33	23
10	5,5	6,3	56	50,3	53	47,3	51	44	48	41	55	43,8	52	40,8	31	25
16	7,7	8	54	47,2	51	44,2	46	39,2	43	36,2	48	39,7	45	36,7	32	25
31,25	11,3	11,4	50	42,9	47	39,9	39	31,5	36	28,5	40	33,9	37	30,9	32	23,6
62,50	16,2	16,5	45	38,4	42	35,4	29	21,8	26	18,8	37	27,9	34	24,9	29	21,5
100	21	21,3	42	35,3	39	32,3	21	14	18	11	30	23,8	27	20,8	27	20,1
200	27,5	-	36	-	33	-	9	-	6	-	22	-	19	-	19	-

Electrical characteristics (LF) at 20 °C

• DC resistance	max.	95 Ω/km
• Resistance unbalance	max.	2 %
• Insulation resistance	min.	2 G Ω x km
• Mutual capacitance	nom.	48 pF/m
• Capacitance unbalance	max.	1500 pF/km
• Characteristic impedance	@ 100MHz	100 ± 5 Ω
• Transfer impedance	@ 1/10/30MHz	20/20/30 mΩ/m
• Coupling attenuation	min.	75 dB
• Velocity of propagation	approx.	67 %
• Propagation delay	nom.	535 ns/100 m
• Skew at 100MHz	nom.	20 ns/100 m
• Testing voltage		1000 V
• Operating voltage	max.	125 V

Mechanical characteristics

• Bending radius during installation	min.	8 x D
• as installed	min.	4 x D
• Tensile strength	max.	120 N
• Crush resistance	min.	1000 N/10cm
• Impact strength	min.	10 impacts
• Temperature range installation		0 °C to +50 °C
• in operation		-20 °C to +60 °C (FR-PVC / LSZH) -40 °C to +80 °C (PE)



Part no.	Dimensions	Outer dia. approx.[mm]	Cu content [kg/km]	Cable weight [kg/km]	Fire load [MJ/m] [kWh/m]	Sheath - Color	Packing [m]
505003	4 x 2 x 0,50	6,4	22	47	0,53 0,15	FR-PVC ¹⁾ (RAL 7035)	500/1000
505006	4 x 2 x 0,50	6,4	22	48	0,49 0,14	FRNC/LSZH ²⁾ (RAL 1021)	500/1000
505009	4 x 2 x 0,50	6,4	22	40	0,72 0,20	PE ³⁾ (RAL 9011)	500/1000

¹⁾ FR-PVC=Flame Reterdant Polyvinyl Chloride

²⁾ FRNC/LSZH=Flame Reterdant Non Corrosive / Low Smoke Zero Halogen

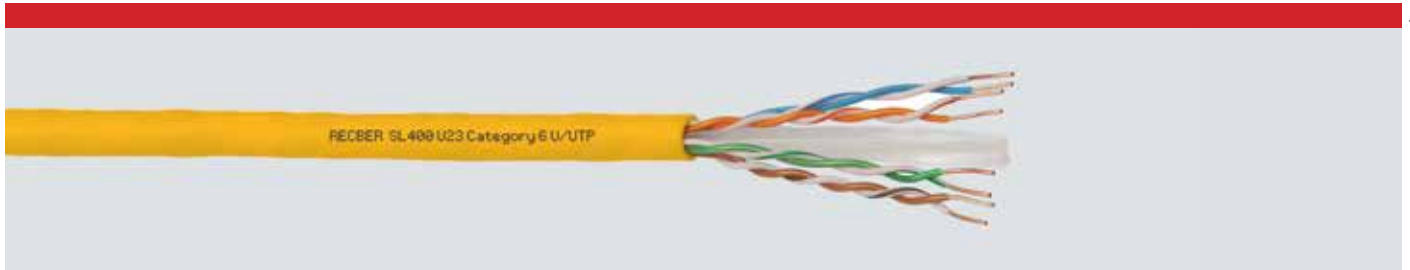
³⁾ PE=Polyethylene

SL400 U23

Data cable , Category 6

U/UTP, Class E, 250MHz

4x2xAWG23

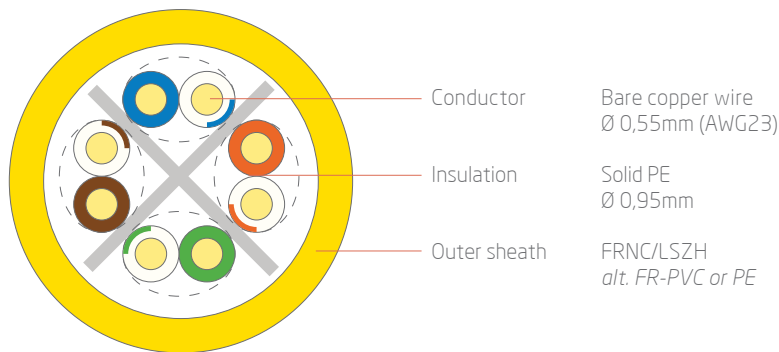


Types
SL400 U23 PVC
SL400 U23 LSZH
SL400 U23Dx LSZH
SL400 U23 PE

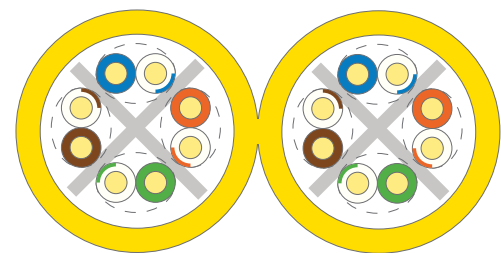
PRODUCT INFORMATION

Cable constructions

SL400 U23



SL400 U23Dx LSZH
Duplex construction



Features and applications

Recber SL400 U23 is premium grade Class E data cable for building structured premises cabling, to support Ethernet protocol for installation in horizontal and backbone areas. They are characterized by large performance reserves and outstanding quality.

Suitable for applications up to Class E (250MHz) 1GbE acc.to IEEE 802.3 ab, VoIP, Power over Ethernet (PoE)/PoE+, transmission of digital and analogue signals, voice, video and data applications. Services such as Ethernet 10 Base-T, Fast Ethernet 100 Base-T, ATM155, FDDI, token ring 4/16 Mbit/s or ISDN.

Standards

- International standard ISO/IEC 11801 2nd ed., IEC 61156-5
- European standard EN 50173-1, EN 50288-6-1
- U.S. Standards ANSI EIA/TIA 568-C.2

Flame resistancy

- Flame retardancy IEC 60332-1-2 (FR-PVC, FRNC/LSZH)
- Halogen free IEC 60754-1/2 (FRNC/LSZH)
- Smoke density IEC 61034-1/2 (FRNC/LSZH)



Low Voltage Directive 2006/95/EC
EC Directive 2011/65/EU

SL400 U23

Data cable , Category 6

U/UTP, Class E, 250MHz

4x2xAWG23

Electrical characteristics (HF) at 20 °C

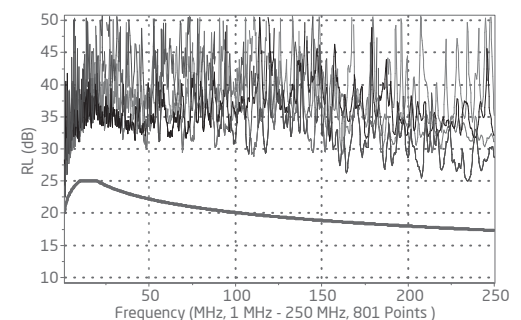
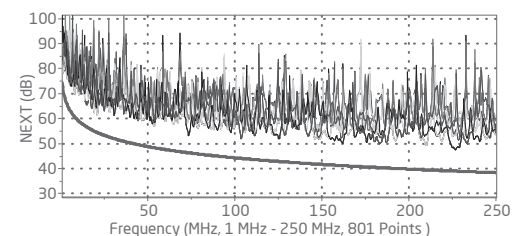
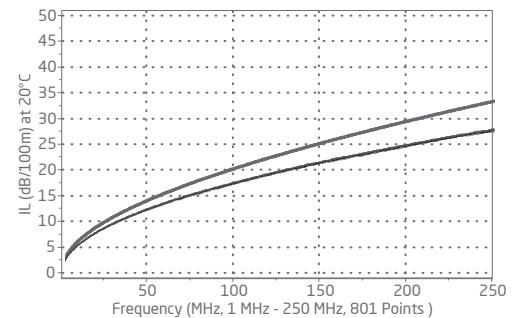
Frequency [MHz]	Attenuation [dB/100m]		NEXT [dB]		PS-NEXT [dB]		ACR [dB/100m]		PS-ACR [dB/100m]		ACR-F [dB/100m]		PS-ACR-F [dB/100m]		RL [dB]	
	typ.	max.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.
1	1,9	2,1	82	66	79	64	80	63,9	77	61,9	85	66	82	64	26	20
4	3,8	3,8	76	65,3	73	63,3	72	61,4	69	59,4	77	58	74	55	31	23
10	5,9	6	70	59,3	67	57,3	64	53,3	61	51,3	68	50	64	47	32	25
16	7,4	7,6	65	56,2	62	54,2	58	48,6	55	46,6	63	45,9	60	42,9	34	25
31,25	10,5	10,7	60	51,9	57	49,9	49	41,1	46	39,1	51	40,1	48	37,1	36	23,6
62,50	15,1	15,5	58	47,4	55	45,4	43	31,9	40	29,9	44	34,1	41	31,1	32	21,5
100	19	19,9	52	44,3	49	42,3	33	24,4	30	22,4	35	30	32	27	32	20,1
250	31	33	48	38,3	45	36,3	17	5,3	14	3,3	19	22	16	19	30	17,3
300	36	-	43	-	40	-	13	-	10	-	14	-	11	-	28	-
400	41,6	-	40	-	37	-	8	-	5	-	8	-	5	-	26	-

Electrical characteristics (LF) at 20 °C

- DC resistance **max.** 76 Ω/km
- Resistance unbalance **max.** 2 %
- Insulation resistance **min.** 2 G Ω x km
- Mutual capacitance **nom.** 48 pF/m
- Capacitance unbalance **max.** 1500 pF/km
- Characteristic impedance **@ 100MHz** 100 ± 5 Ω
- Coupling attenuation **min.** 45 dB (Type 1)
- Velocity of propagation **approx.** 67 %
- Propagation delay **nom.** 535 ns/100 m
- Skew at 100MHz **nom.** 20 ns/100 m
- Testing voltage **nom.** 1000 V
- Operating voltage **max.** 125 V

Mechanical characteristics

- Bending radius during installation **min.** 8 x D
- Bending radius as installed **min.** 4 x D
- Tensile strength **max.** 100 N (Sx)¹⁾, 200 N (Dx)¹⁾
- Crush resistance **min.** 1000 N/10cm
- Impact strength **min.** 10 impacts
- Temperature range installation **min.** 0 °C to +50 °C
- Temperature range in operation **min.** -20 °C to +60 °C (FR-PVC / LSZH)
-40 °C to +80 °C (PE)



Part no.	Dimensions	Outer dia. approx.[mm]	Cu content [kg/km]	Cable weight [kg/km]	Fire load [MJ/m] [kWh/m]	Sheath - Color	Packing [m]
506019	4 x 2 x 0,55	5,8	18	38	0,70 0,19	FR-PVC ²⁾ (RAL 7035)	305/500/1000
506022	4 x 2 x 0,55	5,8	18	39	0,65 0,18	FRNC/LSZH ³⁾ (RAL 1021)	500/1000
506073	2 x (4 x 2 x 0,55)	5,8 x 11,8	36	78	1,30 0,36	FRNC/LSZH ³⁾ (RAL 1021)	500
506025	4 x 2 x 0,55	5,8	18	35	1,05 0,30	PE ⁴⁾ (RAL 9011)	500/1000

¹⁾ Sx= Simplex , Dx= Duplex

²⁾ FR-PVC=Flame Reterdant Polyvinyl Chloride

³⁾ FRNC/LSZH=Flame Reterdant Non Corrosive / Low Smoke Zero Halogen

⁴⁾ PE=Polyethylene

SL400 F/U23

Data cable , Category 6

F/UTP, Class E, 250MHz

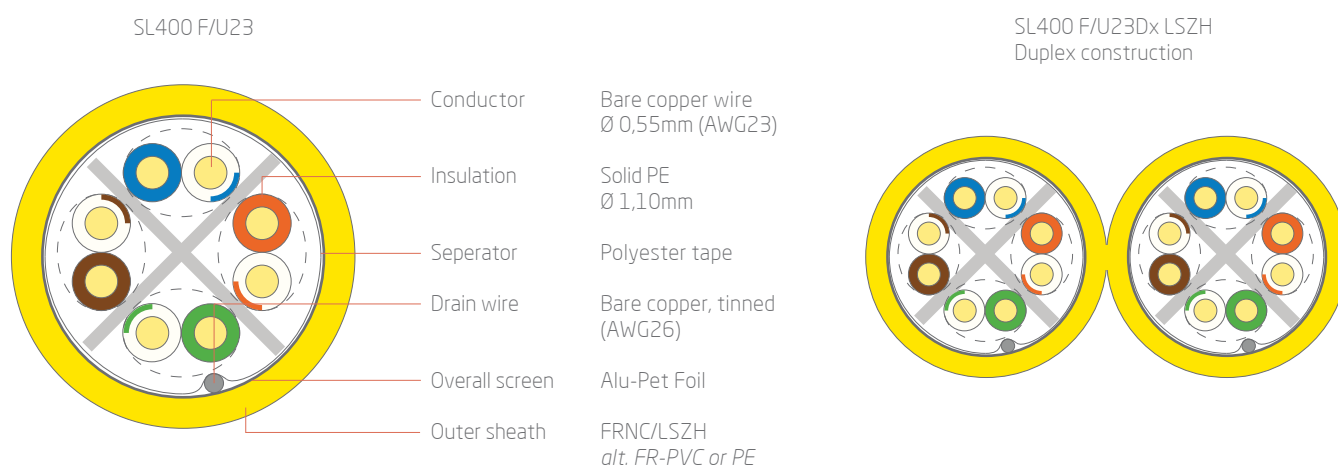
4x2xAWG23



Types
SL400 F/U23 PVC
SL400 F/U23 LSZH
SL400 F/U23Dx LSZH
SL400 F/U23 PE

PRODUCT INFORMATION

Cable constructions



Features and applications

Recber SL400 F/U23 is premium grade Class E data cable for building structured premises cabling, to support Ethernet protocol for installation in horizontal and backbone areas. They are characterized by large performance reserves and outstanding quality. It has excellent shielding efficiency due to overall foil screen.

Suitable for applications up to Class E (250MHz) 1GbE acc.to IEEE 802.3 ab, VoIP, Power over Ethernet (PoE)/PoE+, transmission of digital and analogue signals, voice, video and data applications. Services such as Ethernet 10 Base-T, Fast Ethernet 100 Base-T, ATM155, FDDI, token ring 4/16 Mbit/s or ISDN.

Standards

- International standard ISO/IEC 11801 2nd ed., IEC 61156-5
- European standard EN 50173-1, EN 50288-5-1
- U.S. Standards ANSI EIA/TIA 568-C.2

Flame resistancy

- Flame retardancy IEC 60332-1-2 (FR-PVC, FRNC/LSZH)
- Halogen free IEC 60754-1/2 (FRNC/LSZH)
- Smoke density IEC 61034-1/2 (FRNC/LSZH)



Low Voltage Directive 2006/95/EC
EC Directive 2011/65/EU

SL400 F/U23

Data cable , Category 6

F/UTP, Class E, 250MHz

4x2xAWG23

Electrical characteristics (HF) at 20 °C

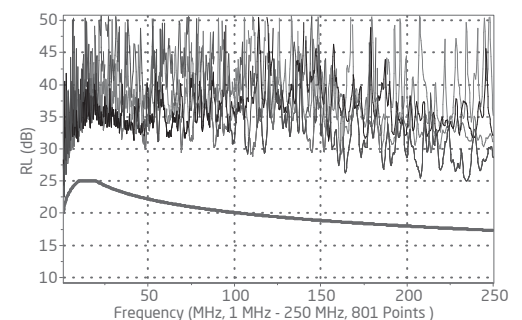
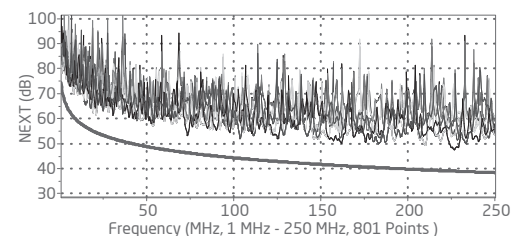
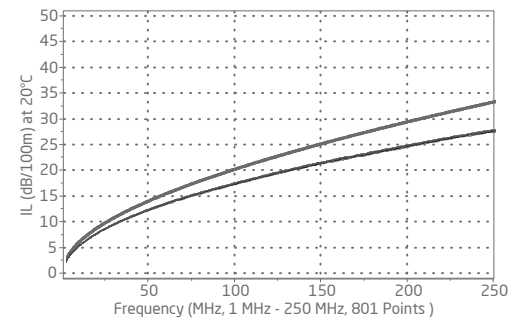
Frequency [MHz]	Attenuation [dB/100m]		NEXT [dB]		PS-NEXT [dB]		ACR [dB/100m]		PS-ACR [dB/100m]		ACR-F [dB/100m]		PS-ACR-F [dB/100m]		RL [dB]	
	typ.	max.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.
1	1,9	2,1	84	66	81	64	82	63,9	79	61,9	85	66	82	64	26	20
4	3,8	3,8	78	65,3	75	63,3	74	61,4	71	59,4	77	58	74	55	31	23
10	5,9	6	72	59,3	69	57,3	66	53,3	63	51,3	68	50	64	47	32	25
16	7,4	7,6	67	56,2	64	54,2	60	48,6	57	46,6	63	45,9	60	42,9	34	25
31,25	10,5	10,7	62	51,9	59	49,9	51	41,1	48	39,1	51	40,1	48	37,1	36	23,6
62,50	15,1	15,5	60	47,4	57	45,4	45	31,9	42	29,9	44	34,1	41	31,1	32	21,5
100	19	19,9	54	44,3	51	42,3	35	24,4	32	22,4	35	30	32	27	32	20,1
250	31	33	50	38,3	47	36,3	19	5,3	16	3,3	19	22	16	19	30	17,3
300	36	-	45	-	42	-	15	-	12	-	14	-	11	-	28	-
400	41,6	-	42	-	39	-	10	-	7	-	8	-	5	-	26	-

Electrical characteristics (LF) at 20 °C

- DC resistance **max.** 76 Ω/km
- Resistance unbalance **max.** 2 %
- Insulation resistance **min.** 2 G Ω x km
- Mutual capacitance **nom.** 48 pF/m
- Capacitance unbalance **max.** 1500 pF/km
- Characteristic impedance **@ 100MHz** 100 ± 5 Ω
- Transfer impedance **@ 1/10/30MHz** 50/100/200 mΩ/m
- Coupling attenuation **min.** 55 dB (Type 1)
- Velocity of propagation **approx.** 67 %
- Propagation delay **nom.** 510 ns/100 m
- Skew at 100MHz **nom.** 25 ns/100 m
- Testing voltage **nom.** 1000 V
- Operating voltage **max.** 125 V

Mechanical characteristics

- Bending radius during installation **min.** 8 x D
- as installed **min.** 4 x D
- Tensile strength **max.** 110 N (Sx)¹⁾, 220 N (Dx)¹⁾
- Crush resistance **min.** 1000 N/10cm
- Impact strength **min.** 10 impacts
- Temperature range installation **min.** 0 °C to +50 °C
- in operation **min.** -20 °C to +60 °C (FR-PVC / LSZH)
-40 °C to +80 °C (PE)



Part no.	Dimensions	Outer dia. approx.[mm]	Cu content [kg/km]	Cable weight [kg/km]	Fire load [MJ/m] [kWh/m]	Sheath - Color	Packing [m]
506020	4 x 2 x 0,55	7,2	20	54	0,90 0,25	FR-PVC ²⁾ (RAL 7035)	500/1000
506023	4 x 2 x 0,55	7,2	20	55	0,85 0,24	FRNC/LSZH ³⁾ (RAL 1021)	500/1000
506032	2 x (4 x 2 x 0,55)	7,2 x 14,6	40	110	1,70 0,48	FRNC/LSZH ³⁾ (RAL 1021)	500
506026	4 x 2 x 0,55	7,2	20	46	1,50 0,42	PE ⁴⁾ (RAL 9011)	500/1000

¹⁾ Sx= Simplex , Dx= Duplex

²⁾ FR-PVC=Flame Retardant Polyvinyl Chloride

³⁾ FRNC/LSZH=Flame Retardant Non Corrosive / Low Smoke Zero Halogen

⁴⁾ PE=Polyethylene

SL400 SF/U23

Data cable , Category 6

SF/UTP, Class E, 250MHz

4x2xAWG23

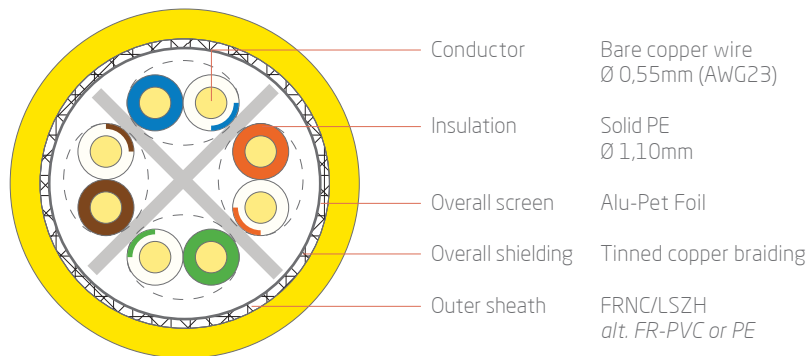


Types
SL400 SF/U23 PVC
SL400 SF/U23 LSZH
SL400 SF/U23Dx LSZH
SL400 SF/U23 PE

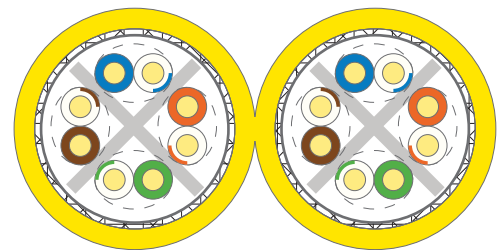
PRODUCT INFORMATION

Cable constructions

SL400 SF/U23



SL400 SF/U23Dx LSZH
Duplex construction



Features and applications

Recher SL400 SF/U23 is premium grade Class E data cable for building structured premises cabling, to support Ethernet protocol for installation in horizontal and backbone areas. They are characterized by large performance reserves and outstanding quality. It has excellent shielding efficiency due to overall foil screen and tinned copper braiding.

Suitable for applications up to Class E (250MHz) 1GbE acc.to IEEE 802.3 ab, VoIP, Power over Ethernet (PoE)/PoE+, transmission of digital and analogue signals, voice, video and data applications. Services such as Ethernet 10 Base-T, Fast Ethernet 100 Base-T, ATM155, FDDI, token ring 4/16 Mbit/s or ISDN.

Standards

- International standard ISO/IEC 11801 2nd ed., IEC 61156-5
- European standard EN 50173-1, EN 50288-5-1
- U.S. Standards ANSI EIA/TIA 568-C.2

Flame resistancy

- Flame retardancy IEC 60332-1-2 (FR-PVC, FRNC/LSZH)
- Halogen free IEC 60754-1/2 (FRNC/LSZH)
- Smoke density IEC 61034-1/2 (FRNC/LSZH)



Low Voltage Directive 2006/95/EC
EC Directive 2011/65/EU

SL400 SF/U23

Data cable , Category 6

SF/UTP, Class E, 250MHz

4x2xAWG23

Electrical characteristics (HF) at 20 °C

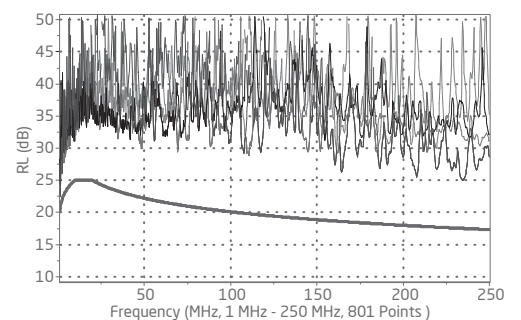
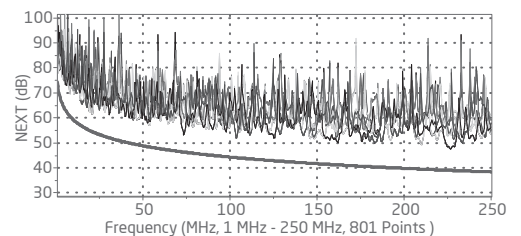
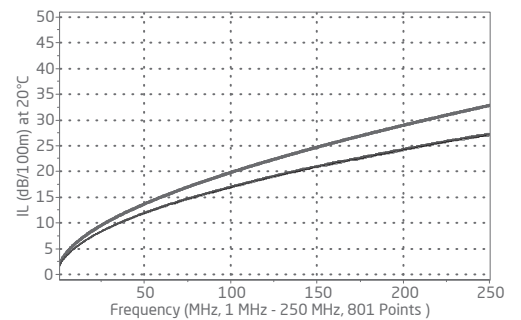
Frequency [MHz]	Attenuation [dB/100m]		NEXT [dB]		PS-NEXT [dB]		ACR [dB/100m]		PS-ACR [dB/100m]		ACR-F [dB/100m]		PS-ACR-F [dB/100m]		RL [dB]	
	typ.	max.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.
1	1,9	2,1	84	66	81	64	82	63,9	79	61,9	85	66	82	64	26	20
4	3,8	3,8	78	65,3	75	63,3	74	61,4	71	59,4	77	58	74	55	31	23
10	5,9	6	72	59,3	69	57,3	66	53,3	63	51,3	68	50	64	47	32	25
16	7,4	7,6	67	56,2	64	54,2	60	48,6	57	46,6	63	45,9	60	42,9	34	25
31,25	10,5	10,7	62	51,9	59	49,9	51	41,1	48	39,1	51	40,1	48	37,1	36	23,6
62,50	15,1	15,5	60	47,4	57	45,4	45	31,9	42	29,9	44	34,1	41	31,1	32	21,5
100	19	19,9	54	44,3	51	42,3	35	24,4	32	22,4	35	30	32	27	32	20,1
250	31	33	50	38,3	47	36,3	19	5,3	16	3,3	19	22	16	19	30	17,3
300	36	-	45	-	42	-	15	-	12	-	14	-	11	-	28	-
400	41,6	-	42	-	39	-	10	-	7	-	8	-	5	-	26	-

Electrical characteristics (LF) at 20 °C

- DC resistance **max.** 76 Ω/km
- Resistance unbalance **max.** 2 %
- Insulation resistance **min.** 2 G Ω x km
- Mutual capacitance **nom.** 48 pF/m
- Capacitance unbalance **max.** 1500 pF/km
- Characteristic impedance **@ 100MHz** 100 ± 5 Ω
- Transfer impedance **@ 1/10/30MHz** 12/10/30 mΩ/m
- Coupling attenuation **min.** 80 dB (Type 1)
- Velocity of propagation **approx.** 67 %
- Propagation delay **nom.** 510 ns/100 m
- Skew at 100MHz **nom.** 25 ns/100 m
- Testing voltage **nom.** 1000 V
- Operating voltage **max.** 125 V

Mechanical characteristics

- Bending radius during installation **min.** 8 x D
- as installed **min.** 4 x D
- Tensile strength **max.** 160 N (Sx)¹⁾, 320 N (Dx)¹⁾
- Crush resistance **min.** 1000 N/10cm
- Impact strength **min.** 10 impacts
- Temperature range installation **0 °C to +50 °C**
- in operation **-20 °C to +60 °C (FR-PVC / LSZH)**
-40 °C to +80 °C (PE)



Part no.	Dimensions	Outer dia. approx.[mm]	Cu content [kg/km]	Cable weight [kg/km]	Fire load [MJ/m] [kWh/m]	Sheath - Color	Packing [m]
506021	4 x 2 x 0,55	7,6	28	62	0,95 0,26	FR-PVC ²⁾ (RAL 7035)	500/1000
506024	4 x 2 x 0,55	7,6	28	63	0,90 0,25	FRNC/LSZH ³⁾ (RAL 1021)	500/1000
506033	2 x (4 x 2 x 0,55)	7,6 x 15,4	56	126	1,80 0,50	FRNC/LSZH ³⁾ (RAL 1021)	500
506027	4 x 2 x 0,55	7,6	28	54	1,56 0,43	PE ⁴⁾ (RAL 9011)	500/1000

¹⁾ Sx= Simplex , Dx= Duplex

²⁾ FR-PVC=Flame Reterdant Polyvinyl Chloride

³⁾ FRNC/LSZH=Flame Reterdant Non Corrosive / Low Smoke Zero Halogen

⁴⁾ PE=Polyethylene

SL500 U/F23

Data cable , Category 6_A

U/FTP, Class E_A, 500MHz

4x2xAWG23

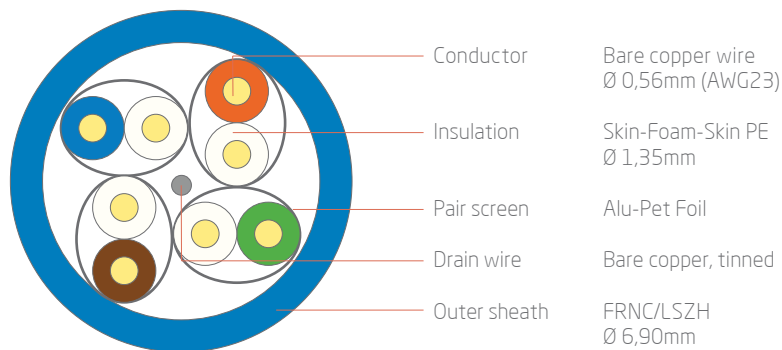


PRODUCT INFORMATION

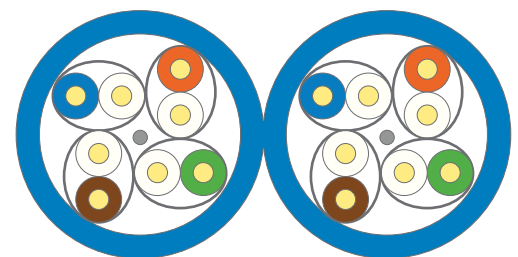
Types
SL500 U/F23 LSZH
SL500 U/F23Dx LSZH

Cable constructions

SL500 U/F23
Simplex construction



SL500 U/F23Dx
Duplex construction



Features and applications

Recber SL500 U/F23 is premium grade Class E_A copper data cable for structured premises cabling systems. They are characterized by large performance reserves and outstanding quality. It has excellent shielding efficiency due to individually screened pairs (PimF).

Suitable for applications up to Class E_A (500MHz), Power over Ethernet (PoE)/PoE+, transmission of digital and analogue signals, video, data, voice, VoIP (Voice over IP), 10GbE acc.to IEEE 802.3.

Standards

- International standard ISO/IEC 11801 2nd ed., IEC 61156-5
- European standard EN 50173-1, EN 50288-10-1

Flame resistancy

- Flame retardancy IEC 60332-1-2
- Halogen free IEC 60754-1/2
- Smoke density IEC 61034-1/2



Low Voltage Directive 2006/95/EC
EC Directive 2011/65/EU

SL500 U/F23

Data cable, Category 6_A

U/FTP, Class E_A, 500MHz

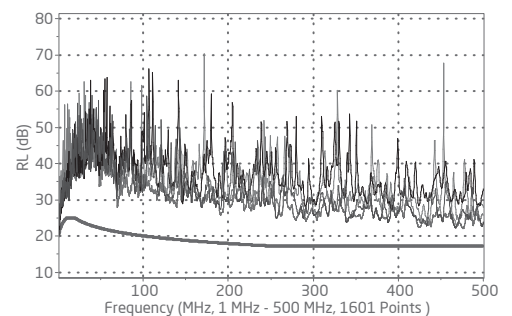
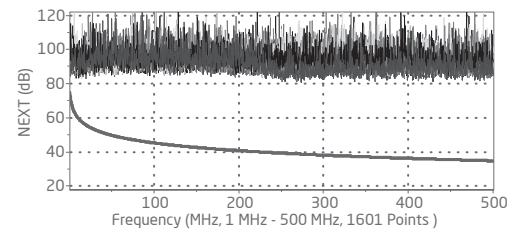
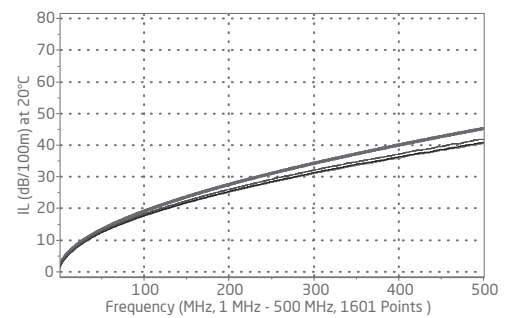
4x2xAWG23

Electrical characteristics (HF) at 20 °C

Frequency [MHz]	Attenuation [dB/100m]		NEXT [dB]		PS-NEXT [dB]		ACR [dB/100m]		PS-ACR [dB/100m]		ACR-F [dB/100m]		PS-ACR-F [dB/100m]		RL [dB]	
	typ.	max.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.
1	1,9	2,1	95	75,3	92	72,3	93	73,2	90	70,2	100	78	97	75	26	20
4	3,5	3,8	95	66,3	92	63,3	91	62,5	88	59,5	100	83,3	97	80,3	27	23
10	5,6	5,9	95	60,3	92	57,3	89	54,4	86	51,4	92	75,3	89	72,3	30	25
16	6,9	7,5	95	57,2	92	54,2	88	49,8	85	46,8	88	71,2	85	68,2	30	25,7
31,25	9,80	10,5	95	52,9	92	49,9	85	42,4	82	39,4	82	65,4	79	62,4	30	23,6
62,50	14,1	15	95	48,4	92	45,4	81	33,4	78	30,4	76	59,4	73	56,4	30	21,5
100	17,7	19,1	95	45,3	92	42,3	77	26,2	74	23,2	72	55,3	69	52,3	30	20,1
250	29,5	31,1	85	39,3	82	36,3	55	8,3	52	5,3	64	47,3	61	44,3	24	17,3
400	38,8	40,1	80	36,3	77	33,3	41	-3,8	38	-6,8	57	43,3	54	40,3	23	15,9
500	43,5	45,3	75	34,8	72	31,8	31	-10,4	28	-13,4	55	41,3	52	38,3	22	15,2

Electrical characteristics (LF) at 20 °C

- DC resistance **max.** 74 Ω/km
- Resistance unbalance **max.** 2 %
- Insulation resistance **min.** 2 G Ω x km
- Mutual capacitance **nom.** 43 pF/m
- Capacitance unbalance **max.** 1500 pF/km
- Characteristic impedance **@ 100MHz** 100 ± 5 Ω
- Transfer impedance **@ 1/10/30MHz** 50/100/200 mΩ/m (Grade 2)
- Coupling attenuation **min.** 55 dB (Type 2)
- Velocity of propagation **approx.** 79 %
- Propagation delay **nom.** 420 ns/100 m
- Skew at 100MHz **nom.** 7 ns/100 m
- Testing voltage **nom.** 1000 V
- Operating voltage **max.** 125 V



Mechanical characteristics

- Bending radius during installation **min.** 8 x D
- Bending radius as installed **min.** 4 x D
- Tensile strength **max.** 100 N (S_x)¹⁾, 200 N (D_x)¹⁾
- Crush resistance **min.** 1000 N/10cm
- Impact strength **min.** 10 impacts
- Temperature range installation **0 °C to +50 °C**
- Temperature range in operation **-20 °C to +60 °C**

Part no.	Dimensions	Outer dia. approx.[mm]	Cu content [kg/km]	Cable weight [kg/km]	Fire load [MJ/m] [kWh/m]	Sheath - Color	Packing [m]
506046	4 x 2 x 0,56	6,90	21	52	0,50 0,14	FRNC/LSZH ²⁾ (RAL 5015)	500/1000
506064	2 x (4 x 2 x 0,56)	6,90 x 14,0	42	104	1,00 0,28	FRNC/LSZH ²⁾ (RAL 5015)	1000

¹⁾ S_x= Simplex, D_x= Duplex

²⁾ FRNC/LSZH=Flame Reterdant Non Corrosive / Low Smoke Zero Halogen

SL500 F/F23

Data cable, Category 6_A

F/FTP, Class E_A, 500MHz

4x2xAWG23

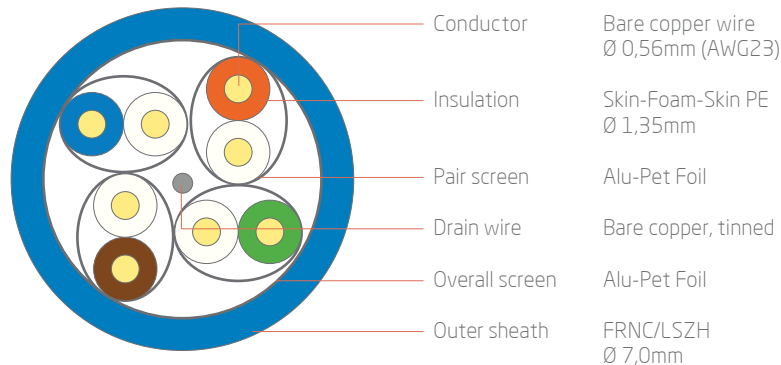


PRODUCT INFORMATION

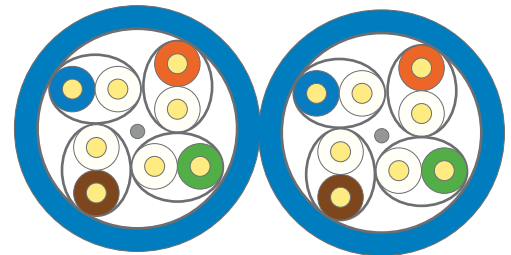
Types
SL500 F/F23 LSZH
SL500 F/F23Dx LSZH

Cable constructions

SL500 F/F23
Simplex construction



SL500 F/F23Dx
Duplex construction



Features and applications

Recber SL500 F/F23 is premium grade Class E_A copper data cable for structured premises cabling systems. They are characterized by large performance reserves and outstanding quality. It has excellent shielding efficiency due to individually screened pairs (PimF) and overall screen.

Suitable for applications up to Class E_A (500MHz), Power over Ethernet (PoE)/PoE+, transmission of digital and analogue signals, video, data, voice, VoIP (Voice over IP), 10GbE acc.to IEEE 802.3.

Standards

- International standard ISO/IEC 11801 2nd ed., IEC 61156-5
- European standard EN 50173-1, EN 50288-10-1

Flame resistancy

- Flame retardancy IEC 60332-1-2
- Halogen free IEC 60754-1/2
- Smoke density IEC 61034-1/2



Low Voltage Directive 2006/95/EC
EC Directive 2011/65/EU

Electrical characteristics (HF) at 20 °C

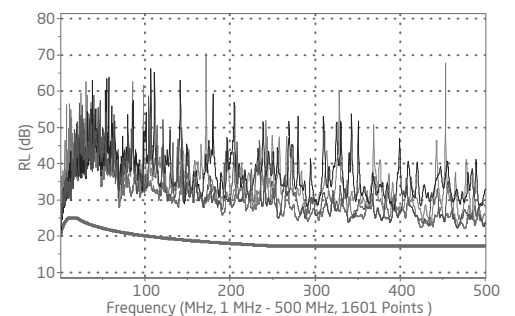
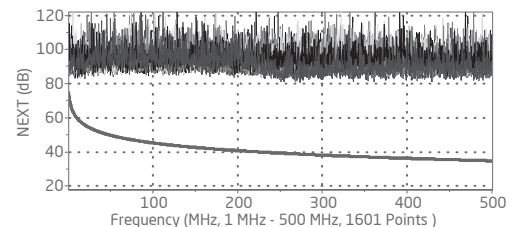
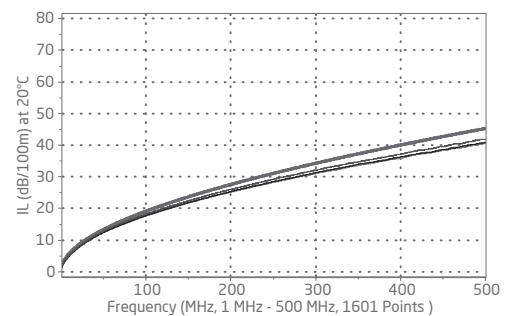
Frequency [MHz]	Attenuation [dB/100m]		NEXT [dB]		PS-NEXT [dB]		ACR [dB/100m]		PS-ACR [dB/100m]		ACR-F [dB/100m]		PS-ACR-F [dB/100m]		RL [dB]	
	typ.	max.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.
1	1,9	2,1	95	75,3	92	72,3	93	73,2	90	70,2	100	78	97	75	26	20
4	3,5	3,8	95	66,3	92	63,3	91	62,5	88	59,5	100	83,3	97	80,3	27	23
10	5,6	5,9	95	60,3	92	57,3	89	54,4	86	51,4	92	75,3	89	72,3	30	25
16	6,9	7,5	95	57,2	92	54,2	88	49,8	85	46,8	88	71,2	85	68,2	30	25,7
31,25	9,80	10,5	95	52,9	92	49,9	85	42,4	82	39,4	82	65,4	79	62,4	30	23,6
62,50	14,1	15	95	48,4	92	45,4	81	33,4	78	30,4	76	59,4	73	56,4	30	21,5
100	17,7	19,1	95	45,3	92	42,3	77	26,2	74	23,2	72	55,3	69	52,3	30	20,1
250	29,5	31,1	85	39,3	82	36,3	55	8,3	52	5,3	64	47,3	61	44,3	24	17,3
400	38,8	40,1	80	36,3	77	33,3	41	-3,8	38	-6,8	57	43,3	54	40,3	23	15,9
500	43,5	45,3	75	34,8	72	31,8	31	-10,4	28	-13,4	55	41,3	52	38,3	22	15,2

Electrical characteristics (LF) at 20 °C

- DC resistance **max.** 74 Ω/km
- Resistance unbalance **max.** 2 %
- Insulation resistance **min.** 2 G Ω x km
- Mutual capacitance **nom.** 43 pF/m
- Capacitance unbalance **max.** 1500 pF/km
- Characteristic impedance **@ 100MHz** 100 ± 5 Ω
- Transfer impedance **@ 1/10/30MHz** 20/50/100 mΩ/m (Grade 2)
- Coupling attenuation **min.** 65 dB (Type 2)
- Velocity of propagation **approx.** 79 %
- Propagation delay **nom.** 420 ns/100 m
- Skew at 100MHz **nom.** 7 ns/100 m
- Testing voltage 1000 V
- Operating voltage **max.** 125 V

Mechanical characteristics

- Bending radius during installation **min.** 8 x D
- as installed **min.** 4 x D
- Tensile strength **max.** 100 N (S_x)¹⁾, 200 N (D_x)¹⁾
- Crush resistance **min.** 1000 N/10cm
- Impact strength **min.** 10 impacts
- Temperature range installation 0 °C to +50 °C
- in operation -20 °C to +60 °C



Part no.	Dimensions	Outer dia. approx.[mm]	Cu content [kg/km]	Cable weight [kg/km]	Fire load [MJ/m] [kWh/m]	Sheath - Color	Packing [m]
506047	4 x 2 x 0,56	7,00	21	53	0,53 0,15	FRNC/LSZH ²⁾ (RAL 5015)	500/1000
506065	2 x (4 x 2 x 0,56)	7,00 x 14,2	42	106	1,06 0,30	FRNC/LSZH ²⁾ (RAL 5015)	1000

¹⁾ S_x= Simplex, D_x= Duplex

²⁾ FRNC/LSZH=Flame Retardant Non Corrosive / Low Smoke Zero Halogen

SL900 S/F23

Data cable , Category 7

S/FTP, Class F, 600MHz

4x2xAWG23

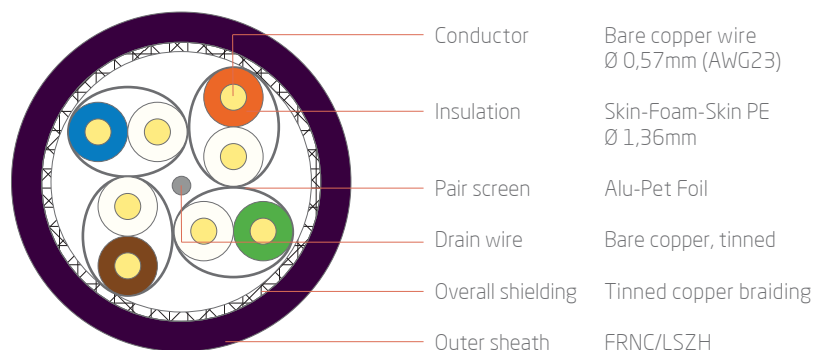


PRODUCT INFORMATION

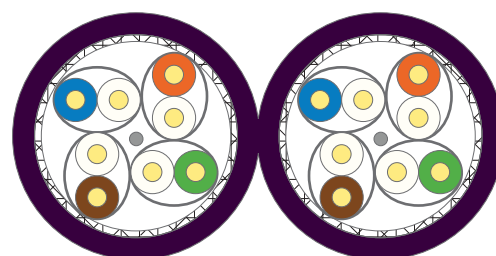
Types
SL900 S/F23 LSZH
SL900 S/F23Dx LSZH

Cable constructions

SL900 S/F23
Simplex construction



SL900 S/F23Dx
Duplex construction



Features and applications

Recher SL900 S/F23 is premium grade Class F copper data cable for structured premises cabling systems. They are characterized by large performance reserves and outstanding quality. It has excellent shielding efficiency due to individually screened pairs (PimF) and overall tinned copper braiding.

Suitable for applications up to Class F (600MHz) , Power over Ethernet (PoE)/PoE+, transmission of digital and analogue signals, video, data, voice ,VoIP (Voice over IP), 10GbE acc.to IEEE 802.3.

Standards

- International standard ISO/IEC 11801 2nd ed., IEC 61156-5
- European standard EN 50173-1, EN 50288-4-1

Flame resistancy

- Flame retardancy IEC 60332-1-2
- Halogen free IEC 60754-1/2
- Smoke density IEC 61034-1/2



Low Voltage Directive 2006/95/EC
EC Directive 2011/65/EU

SL900 S/F23

Data cable , Category 7

S/FTP, Class F, 600MHz

4x2xAWG23

Electrical characteristics (HF) at 20 °C

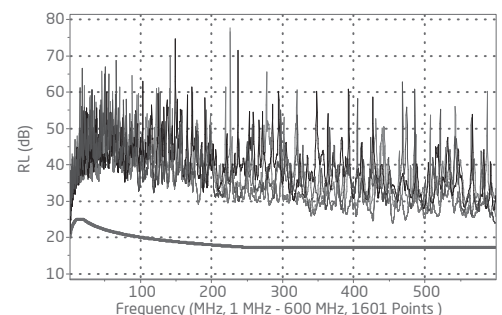
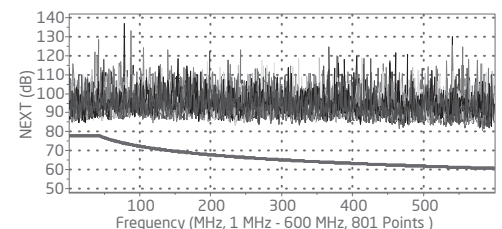
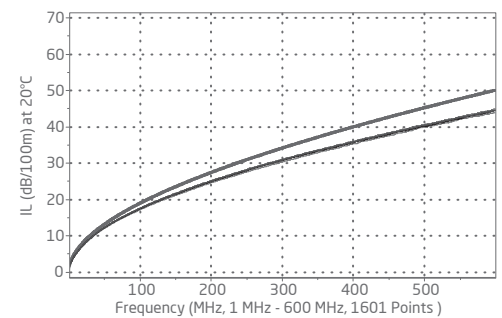
Frequency [MHz]	Attenuation [dB/100m]		NEXT [dB]		PS-NEXT [dB]		ACR [dB/100m]		PS-ACR [dB/100m]		ACR-F [dB/100m]		PS-ACR-F [dB/100m]		RL [dB]	
	typ.	max.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.
1	1,8	2,0	100	80	97	77	98	78	95	75	107	80	104	77	26	20
4	3,3	3,6	100	80	97	77	96	77	93	74	107	80	104	77	30	23
10	5,3	5,7	100	80	97	77	94	74	91	71	104	74	101	71	33	25
100	17,5	18,5	100	72	97	69	82	54	79	51	92	54	89	51	33	20,1
200	25,2	26,8	100	68	97	65	75	41	72	38	84	48	81	45	32	18
250	28,0	30,2	100	66	97	63	72	36	69	33	81	46	78	43	30	17,3
500	40,5	44,1	96	62	93	59	55	18	52	15	68	40	65	37	27	17,3
600	44,5	48,9	90	61	87	58	45	12	42	9	64	38	61	35	25	17,3
800	53,5	-	84	-	81	-	30	-	27	-	56	-	53	-	23	-
862	55,0	-	83	-	80	-	28	-	25	-	54	-	51	-	22	-
900	57,0	-	81	-	78	-	24	-	21	-	49	-	46	-	21	-

Electrical characteristics (LF) at 20 °C

• DC resistance	max.	72 Ω/km
• Resistance unbalance	max.	2 %
• Insulation resistance	min.	2 G Ω x km
• Mutual capacitance	nom.	42 pF/m
• Capacitance unbalance	max.	1500 pF/km
• Characteristic impedance	@ 100MHz	100 ± 5 Ω
• Transfer impedance	@ 1/10/30MHz	5/5/10 mΩ/m (Grade 1)
• Coupling attenuation	min.	85 dB (Type 1)
• Velocity of propagation	approx.	79 %
• Propagation delay	nom.	420 ns/100 m
• Skew at 100MHz	nom.	5 ns/100 m
• Testing voltage		1000 V
• Operating voltage	max.	125 V

Mechanical characteristics

• Bending radius during installation	min.	8 x D
• Bending radius as installed	min.	4 x D
• Tensile strength	max.	110 N (Sx) ¹⁾ , 220 N (Dx) ¹⁾
• Crush resistance	min.	1000 N/10cm
• Impact strength	min.	10 impacts
• Temperature range installation		0 °C to +50 °C
• Temperature range in operation		-20 °C to +60 °C



Part no.	Dimensions	Outer dia. approx.[mm]	Cu content [kg/km]	Cable weight [kg/km]	Fire load [MJ/m] [kWh/m]	Sheath - Color	Packing [m]
507002	4 x 2 x 0,57	7,40	30	60	0,57 0,16	FRNC/LSZH ²⁾ (RAL 4007)	500/1000
507005	2 x (4 x 2 x 0,57)	7,40 x 15,6	60	120	1,14 0,32	FRNC/LSZH ²⁾ (RAL 4007)	1000

¹⁾ Sx= Simplex , Dx= Duplex

²⁾ FRNC/LSZH=Flame Reterdant Non Corrosive / Low Smoke Zero Halogen

SL1200 S/F23

Data cable, Category 7_A

S/FTP, Class F_A, 1000MHz

4x2xAWG23



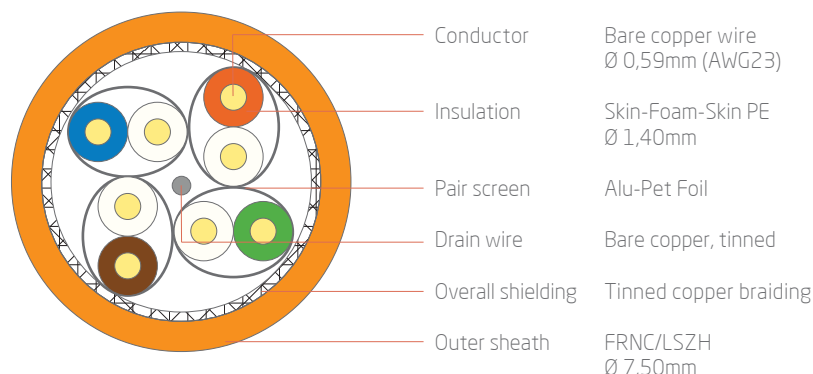
PRODUCT INFORMATION

Types

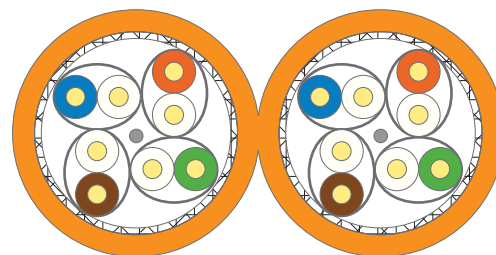
SL1200 S/F23 LSZH
SL1200 S/F23Dx LSZH

Cable constructions

SL1200 S/F23
Simplex construction



SL1200 S/F23Dx
Duplex construction



Features and applications

Recber SL1200 S/F23 is premium grade Class F_A copper data cable for structured premises cabling systems. They are characterized by large performance reserves and outstanding quality. It has excellent shielding efficiency due to individually screened pairs (PimF) and overall tinned copper braiding.

Suitable for applications up to Class F_A (1000MHz), Power over Ethernet (PoE)/PoE+, transmission of digital and analogue signals, video, data, voice, VoIP (Voice over IP), 10GbE acc. to IEEE 802.3.

Standards

- International standard ISO/IEC 11801 2nd ed., IEC 61156-5
- European standard EN 50173-1, EN 50288-9-1

Flame resistancy

- Flame retardancy IEC 60332-1-2
- Halogen free IEC 60754-1/2
- Smoke density IEC 61034-1/2



Low Voltage Directive 2006/95/EC
EC Directive 2011/65/EU

SL1200 S/F23

Data cable, Category 7_A

S/FTP, Class F_A, 1000MHz

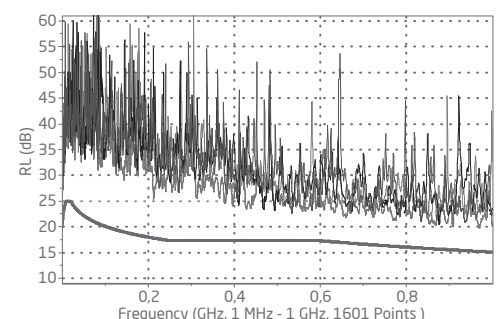
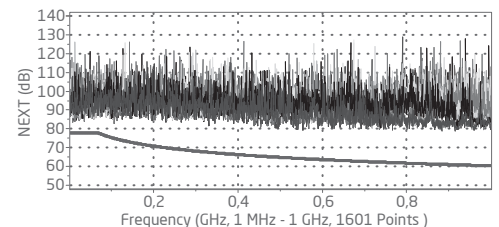
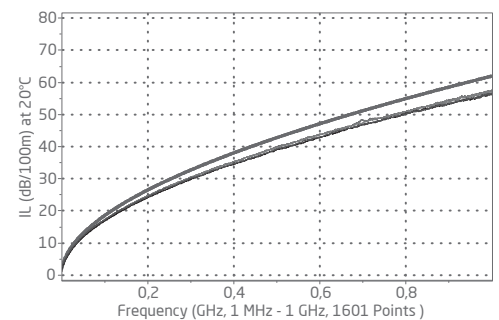
4x2xAWG23

Electrical characteristics (HF) at 20 °C

Frequency [MHz]	Attenuation [dB/100m]		NEXT [dB]		PS-NEXT [dB]		ACR [dB/100m]		PS-ACR [dB/100m]		ACR-F [dB/100m]		PS-ACR-F [dB/100m]		RL [dB]	
	typ.	max.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.
1	1,9	2,1	104	78	101	75	102	75,9	99	72,9	108	78	105	75	26	20
4	3,5	3,7	104	78	101	75	100	74,3	97	71,3	107	78	104	75	30	23
10	5,4	5,8	104	78	101	75	99	72,2	96	69,2	104	75,3	101	72,3	33	25
100	17,4	18,5	104	75,4	101	72,4	87	56,9	84	53,9	92	55,3	89	52,3	33	20,1
200	24,9	26,5	104	70,9	101	67,9	79	44,4	76	41,4	84	49,3	81	46,3	32	18
250	27,8	29,7	104	69,4	101	66,4	76	39,7	73	36,7	79	47,3	76	44,3	30	17,3
500	40,1	42,8	99	64,9	96	61,9	59	22,2	56	19,2	67	41,3	64	38,3	28	17,3
600	43,8	47,1	93	63,7	90	60,7	50	16,6	47	13,6	60	39,7	57	36,7	25	17,3
862	54,0	57,2	86	61,4	83	58,4	32	4,2	29	1,2	53	36,6	50	33,6	23	15,7
1000	58,0	61,9	84	60,4	81	57,4	26	-1,5	23	-4,5	43	35,3	40	32,3	20	15,1
1200	64	-	82	-	79	-	18	-	15	-	38	-	35	-	19	-

Electrical characteristics (LF) at 20 °C

- DC resistance **max.** 68 Ω/km
- Resistance unbalance **max.** 2 %
- Insulation resistance **min.** 2 G Ω x km
- Mutual capacitance **nom.** 42 pF/m
- Capacitance unbalance **max.** 1500 pF/km
- Characteristic impedance **@ 100MHz** 100 ± 5 Ω
- Transfer impedance **@ 1/10/30MHz** 5/5/10 mΩ/m (Grade 1)
- Coupling attenuation **min.** 85 dB (Type 1)
- Velocity of propagation **approx.** 79 %
- Propagation delay **nom.** 420 ns/100 m
- Skew at 100MHz **nom.** 5 ns/100 m
- Testing voltage **nom.** 1000 V
- Operating voltage **max.** 125 V



Mechanical characteristics

- Bending radius during installation **min.** 8 x D
- Bending radius as installed **min.** 4 x D
- Tensile strength **max.** 110 N (Sx)¹⁾, 220 N (Dx)¹⁾
- Crush resistance **min.** 1000 N/10cm
- Impact strength **min.** 10 impacts
- Temperature range installation **min.** 0 °C to +50 °C
- Temperature range in operation **min.** -20 °C to +60 °C

Part no.	Dimensions	Outer dia. approx.[mm]	Cu content [kg/km]	Cable weight [kg/km]	Fire load [MJ/m] [kWh/m]	Sheath - Color	Packing [m]
507008	4 x 2 x 0,59	7,50	32	63	0,64 0,18	FRNC/LSZH ²⁾ (RAL 2003)	500/1000
507011	2 x (4 x 2 x 0,59)	7,50 x 15,8	64	126	1,28 0,36	FRNC/LSZH ²⁾ (RAL 2003)	500

¹⁾ Sx= Simplex, Dx= Duplex

²⁾ FRNC/LSZH=Flame Reterdant Non Corrosive / Low Smoke Zero Halogen

SL1500 S/F22

Data cable, Category 7_A

S/FTP, Class F_A, 1200MHz

4x2xAWG22

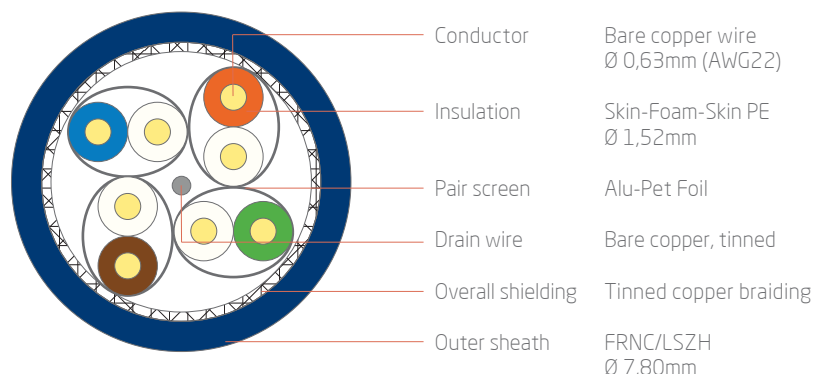


PRODUCT INFORMATION

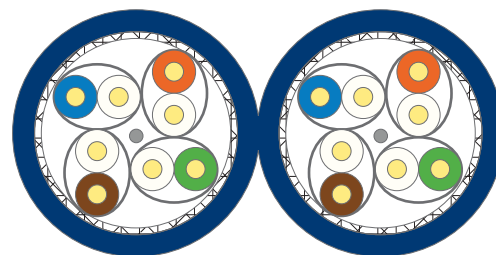
Types
SL1500 S/F22 LSZH
SL1500 S/F22Dx LSZH

Cable constructions

SL1500 S/F22
Simplex construction



SL1500 S/F22Dx
Duplex construction



Features and applications

Recber SL1500 S/F22 is premium grade Class F_A copper data cable for structured premises cabling systems. They are characterized by large performance reserves and outstanding quality. It has excellent shielding efficiency due to individually screened pairs (PimF) and overall tinned copper braiding.

Suitable for applications up to Class F_A (1200MHz), Power over Ethernet (PoE)/PoE+, transmission of digital and analogue signals, video, data, voice, VoIP (Voice over IP), 10GbE acc. to IEEE 802.3.

Standards

- International standard ISO/IEC 11801 2nd ed., IEC 61156-5, IEC 61156-7
- European standard EN 50173-1, EN 50288-9-1

Flame resistancy

- Flame retardancy IEC 60332-1-2
- Halogen free IEC 60754-1/2
- Smoke density IEC 61034-1/2



Low Voltage Directive 2006/95/EC
EC Directive 2011/65/EU

SL1500 S/F22

Data cable, Category 7_A

S/FTP, Class F_A, 1200MHz

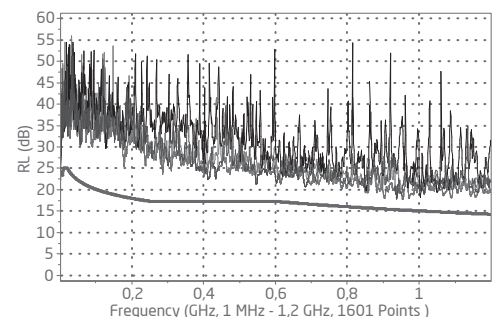
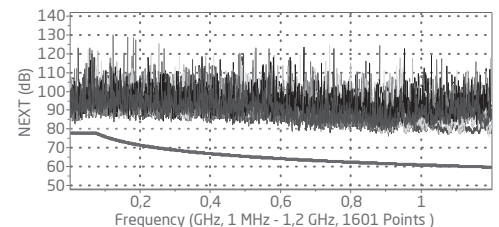
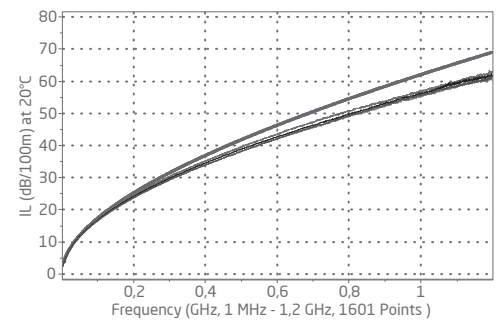
4x2xAWG22

Electrical characteristics (HF) at 20 °C

Frequency [MHz]	Attenuation [dB/100m]		NEXT [dB]		PS-NEXT [dB]		ACR [dB/100m]		PS-ACR [dB/100m]		ACR-F [dB/100m]		PS-ACR-F [dB/100m]		RL [dB]	
	typ.	max.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.
1	1,7	1,9	105	78	102	75	103	76,1	100	73,1	110	78	107	75	26	20
4	3,2	3,5	105	78	102	75	102	74,5	99	71,5	108	78	105	75	30	23
10	4,9	5,4	105	78	102	75	100	72,6	97	69,6	105	74	102	71	33	25
100	16,1	17,5	105	76	102	73	89	58,5	86	55,5	95	54	92	51	33	20,1
250	26	28,5	105	70	102	67	79	41,5	76	38,5	85	46	82	43	27	17,3
500	37,2	41,8	99	65,5	96	62,5	62	23,7	59	20,7	71	40	78	37	26	17,3
600	40,2	46,3	96	64,3	93	61,3	56	18	53	15	63	38,4	60	35,4	26	17,3
862	49	56,9	93	62	90	59	44	5,1	41	2,1	56	35,3	53	32,3	23	15,7
1000	54,8	62	88	61	85	58	33	-1	30	-4	52	34	49	31	22	15,1
1200	58,0	69	85	59,8	82	56,8	27	-9,2	24	-12,2	43	32,4	40	29,4	20	14,3
1500	67,5	-	81	-	78	-	15	-	12	-	38	-	35	-	19	-

Electrical characteristics (LF) at 20 °C

- DC resistance **max.** 60 Ω/km
- Resistance unbalance **max.** 2 %
- Insulation resistance **min.** 2 G Ω x km
- Mutual capacitance **nom.** 41 pF/m
- Capacitance unbalance **max.** 1500 pF/km
- Characteristic impedance **@ 100MHz** 100 ± 5 Ω
- Transfer impedance **@ 1/10/30MHz** 5/5/8 mΩ/m (Grade 1)
- Coupling attenuation **min.** 85 dB (Type 1)
- Velocity of propagation **approx.** 79 %
- Propagation delay **nom.** 420 ns/100 m
- Skew at 100MHz **nom.** 5 ns/100 m
- Testing voltage **nom.** 1000 V
- Operating voltage **max.** 125 V



Mechanical characteristics

- Bending radius during installation **min.** 8 x D
- Bending radius as installed **min.** 4 x D
- Tensile strength **max.** 130 N (Sx)¹⁾, 260 N (Dx)¹⁾
- Crush resistance **min.** 1000 N/10cm
- Impact strength **min.** 10 impacts
- Temperature range installation **min.** 0 °C to +50 °C
- Temperature range in operation **min.** -20 °C to +60 °C

Part no.	Dimensions	Outer dia. approx.[mm]	Cu content [kg/km]	Cable weight [kg/km]	Fire load [MJ/m] [kWh/m]	Sheath - Color	Packing [m]
507008	4 x 2 x 0,63	7,80	35	67	0,72 0,20	FRNC/LSZH ²⁾ (RAL 5002)	500/1000
507011	2 x (4 x 2 x 0,63)	7,80 x 16,4	70	134	1,44 0,40	FRNC/LSZH ²⁾ (RAL 5002)	500

¹⁾ Sx= Simplex, Dx= Duplex

²⁾ FRNC/LSZH=Flame Reterdant Non Corrosive / Low Smoke Zero Halogen



COAXIAL 

Cables

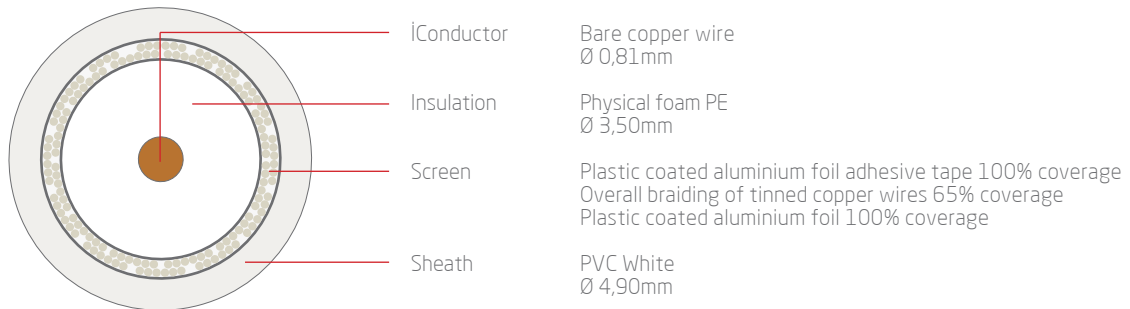


TRB 80 Plus

75 Ohm HGV Coaxial Cable



Cable construction



Application

In CATV distribution networks, the cable operating in the range 5-3000 MHz in compliance with the standards EN 50117, is designed for satellite and terrestrial broadcasting. Additionally, it can also be used as distribution cable to transmit signals for indoor applications.

Technical information

Temperature range	-30 °C ... +70 °C	Attenuation @20 °C	50 MHz	5,90 dB/100m
Min. bending radius	10 x D		200 MHz	11,7 dB/100m
			470 MHz	18,1 dB/100m
Impedance	75 ± 3 Ω		860 MHz	24,8 dB/100m
Capacitance	52 ± 2 pF/m		1000 MHz	26,8 dB/100m
Velocity of propagation	%85 ± 2		2150 MHz	40,6 dB/100m
Insulation resistance	≥ 2 G Ω x km		2400 MHz	43,2 dB/100m
Max. operating voltage	1300 V		3000 MHz	48,9 dB/100m
Test voltage	3000 V			
Standards	EN 50117, IEC 61196	Return loss ¹⁾	5-470 MHz	> 20 dB
Features			470-1000MHz	> 18 dB
Vertical flame propagation	EN 60332-1-2		1000-2000 MHz	> 16 dB
			2000-3000 MHz	> 15 dB
		Screening attenuation	30-1000MHz	≥ 95 dB
			1000-2000 MHz	≥ 85 dB
			2000-3000 MHz	≥ 75 dB
		Transfer impedance	5-30MHz	≤ 2,5 mΩ/m
		Screening class	Class A+	

¹⁾ According to EN 50117, in each frequency band, 3 peak return loss values up to 4 dB lower than the stated specified limit are permissible.


 Low Voltage Directive 2006/95/EC
 EC Directive 2011/65/EU

Part no.	Cable construction	Outer dia. approx. [mm]	Cu content [kg/km]	Cable weight [kg/km]	Sheath - Color	Packing [m]
307128	TRB 80 Plus	4,90	12	26	White (RAL 9003)	100/500/1000

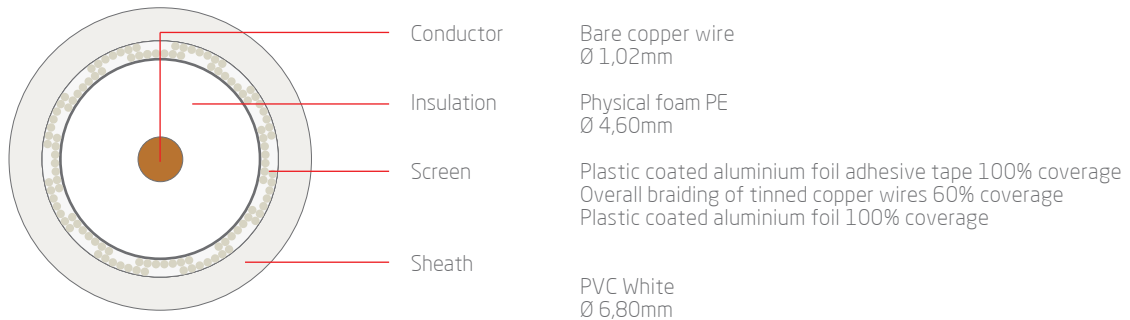
TRB 102 Plus

75 Ohm HGV Coaxial Cable



Class A+
EN 50117-2-4

Cable construction



Application

In CATV distribution networks, the cable operating in the range 5-3000 MHz in compliance with the standards EN 50117, is designed for satellite and terrestrial broadcasting. Additionally, it can also be used as distribution cable to transmit signals for indoor applications.

Technical information

Temperature range	-30 °C ... +70 °C	Attenuation @20 °C	50 MHz	4,90 dB/100m
Min. bending radius	10 x D		200 MHz	9,60 dB/100m
			470 MHz	14,8 dB/100m
Impedance	75 ± 3 Ω		860 MHz	20,4 dB/100m
Capacitance	52 ± 2 pF/m		1000 MHz	22,1 dB/100m
Velocity of propagation	%84 ± 2		2150 MHz	33,7 dB/100m
Insulation resistance	≥ 2 G Ω x km		2400 MHz	35,8 dB/100m
Max. operating voltage	1300 V		3000 MHz	40,7 dB/100m
Test voltage	3000 V			
Standards	EN 50117, IEC 61196	Return loss ¹⁾	5-470 MHz	> 20 dB
Features			470-1000MHz	> 18 dB
Vertical flame propagation	EN 60332-1-2		1000-2000 MHz	> 16 dB
			2000-3000 MHz	> 15 dB
		Screening attenuation	30-1000MHz	≥ 95 dB
			1000-2000 MHz	≥ 85 dB
			2000-3000 MHz	≥ 75 dB
		Transfer impedance	5-30MHz	≤ 2,5 mΩ/m
		Screening class	Class A+	

¹⁾ According to EN 50117, in each frequency band, 3 peak return loss values up to 4 dB lower than the stated specified limit are permissible.


 Low Voltage Directive 2006/95/EC
 EC Directive 2011/65/EU

Part no.	Cable construction	Outer dia. approx. [mm]	Cu content [kg/km]	Cable weight [kg/km]	Sheath - Color	Packing [m]
307129	TRB 102 Plus	6,80	16	49	White (RAL 9003)	100/500/1000

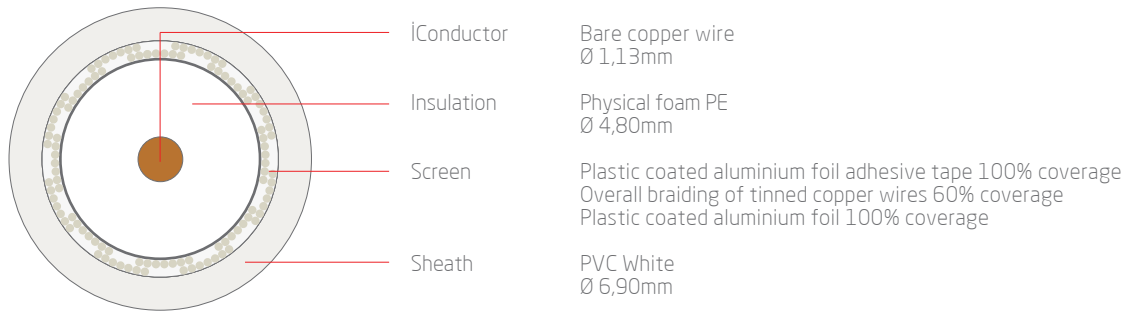
TRB 113 Plus

75 Ohm HGV Coaxial Cable



Class A+
EN 50117-2-4

Cable construction



Application

In CATV distribution networks, the cable operating in the range 5-3000 MHz in compliance with the standards EN 50117, is designed for satellite and terrestrial broadcasting. Additionally, it can also be used as distribution cable to transmit signals for indoor applications.

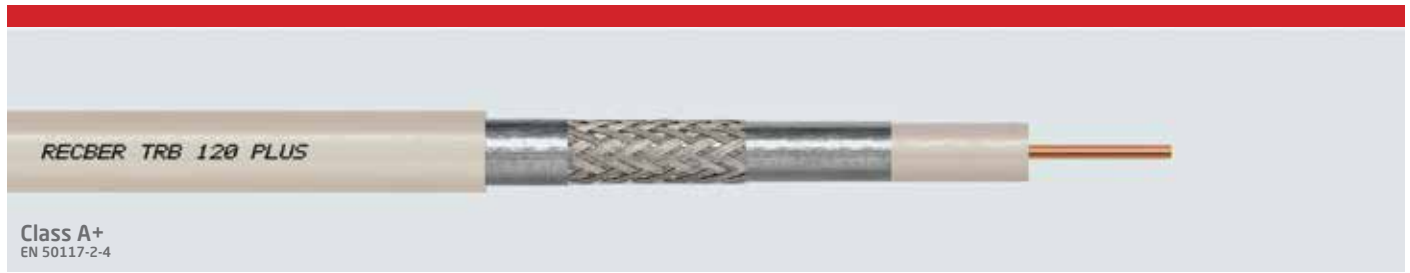
Technical information

Temperature range	-30 °C ... +70 °C	Attenuation @20 °C	50 MHz	4,30 dB/100m
Min. bending radius	10 x D		200 MHz	8,40 dB/100m
Impedance	75 ± 3 Ω		470 MHz	13,0 dB/100m
Capacitance	52 ± 2 pF/m		860 MHz	18,0 dB/100m
Velocity of propagation	%86 ± 2		1000 MHz	19,5 dB/100m
Insulation resistance	≥ 2 G Ω x km		2150 MHz	29,7 dB/100m
Max. operating voltage	1300 V		2400 MHz	31,7 dB/100m
Test voltage	3000 V		3000 MHz	36,0 dB/100m
Standards	EN 50117, IEC 61196	Return loss ¹⁾	5-470 MHz	> 23 dB
Features			470-1000MHz	> 20 dB
Vertical flame propagation	EN 60332-1-2		1000-2000 MHz	> 18 dB
			2000-3000 MHz	> 16 dB
		Screening attenuation	30-1000MHz	≥ 95 dB
			1000-2000 MHz	≥ 85 dB
			2000-3000 MHz	≥ 75 dB
		Transfer impedance	5-30MHz	≤ 2,5 mΩ/m
		Screening class	Class A+	

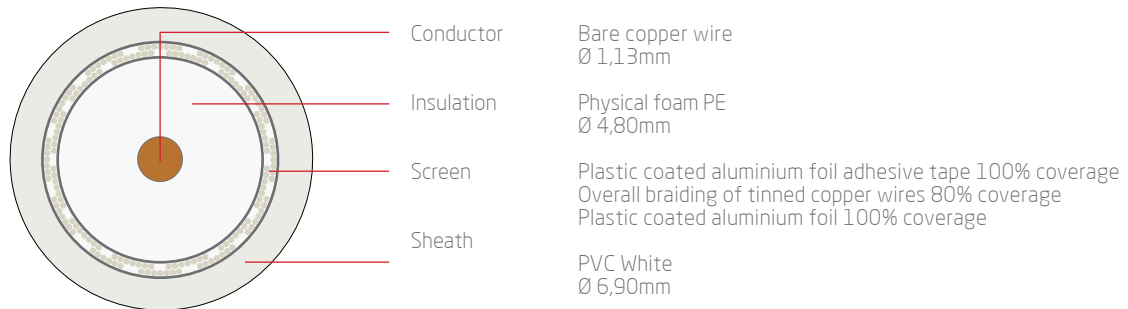
¹⁾ According to EN 50117, in each frequency band, 3 peak return loss values up to 4 dB lower than the stated specified limit are permissible.


 Low Voltage Directive 2006/95/EC
 EC Directive 2011/65/EU

Part no.	Cable construction	Outer dia. approx. [mm]	Cu content [kg/km]	Cable weight [kg/km]	Sheath - Color	Packing [m]
307130	TRB 113 Plus	6,90	18	50	White (RAL 9003)	100/500/1000



Cable construction



Application

In CATV distribution networks, the cable operating in the range 5-3000 MHz in compliance with the standards EN 50117, is designed for satellite and terrestrial broadcasting. Additionally, it can also be used as distribution cable to transmit signals for indoor applications.

Technical information

Temperature range	-30 °C ... +70 °C	Attenuation @20 °C	50 MHz	4,30 dB/100m
Min. bending radius	10 x D		200 MHz	8,40 dB/100m
			470 MHz	13,0 dB/100m
Impedance	75 ± 3 Ω		860 MHz	18,0 dB/100m
Capacitance	52 ± 2 pF/m		1000 MHz	19,5 dB/100m
Velocity of propagation	%86 ± 2		2150 MHz	29,7 dB/100m
Insulation resistance	≥ 2 G Ω x km		2400 MHz	31,7 dB/100m
Max. operating voltage	1300 V		3000 MHz	36,0 dB/100m
Test voltage	3000 V			
Standards	EN 50117, IEC 61196	Return loss ¹⁾	5-470 MHz	> 23 dB
Features			470-1000MHz	> 20 dB
Vertical flame propagation	EN 60332-1-2		1000-2000 MHz	> 18 dB
			2000-3000 MHz	> 16 dB
		Screening attenuation	30-1000MHz	≥ 95 dB
			1000-2000 MHz	≥ 85 dB
			2000-3000 MHz	≥ 75 dB
		Transfer impedance	5-30MHz	≤ 2,5 mΩ/m
		Screening class	Class A+	

¹⁾ According to EN 50117, in each frequency band, 3 peak return loss values up to 4 dB lower than the stated specified limit are permissible.

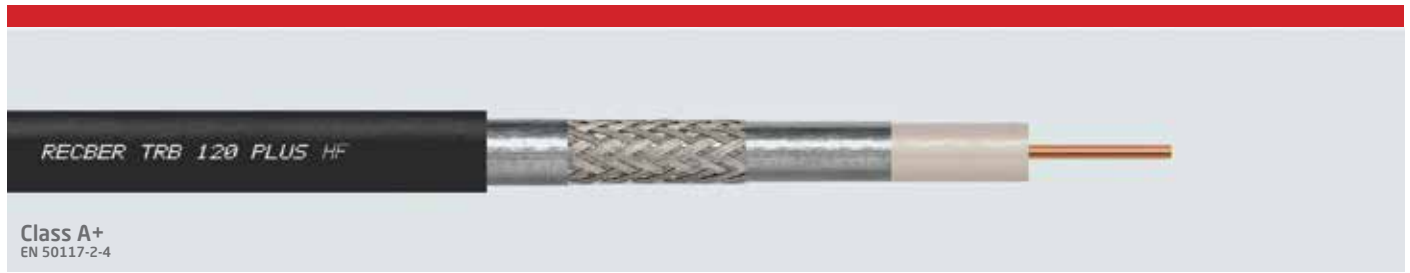


 Low Voltage Directive 2006/95/EC
 EC Directive 2011/65/EU

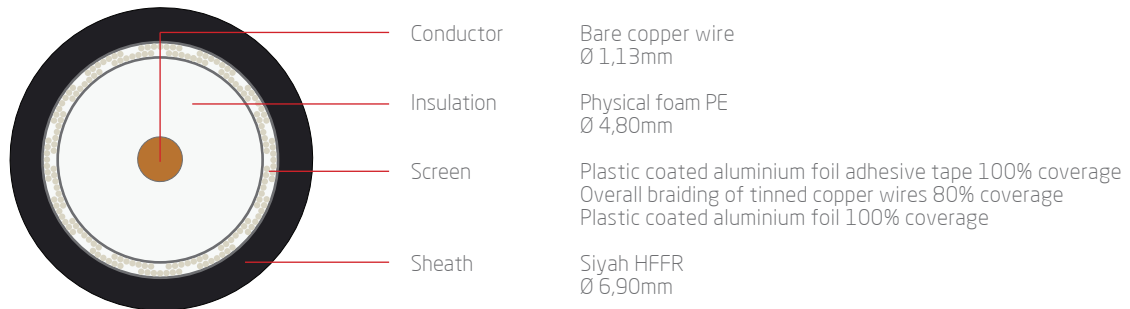
Part no.	Cable construction	Outer dia. approx. [mm]	Cu content [kg/km]	Cable weight [kg/km]	Sheath - Color	Packing [m]
307131	TRB 120 Plus	6,90	22	53	White (RAL 9003)	100/500/1000
307106	TRB 120 Plus	6,90	22	53	Purple (RAL 4005)	100/500/1000

TRB 120 Plus HF

75 Ohm HGV Coaxial Cable



Cable construction



Application

In CATV distribution networks, the cable operating in the range 5-3000 MHz in compliance with the standards EN 50117, is designed for satellite and terrestrial broadcasting. Additionally, it can also be used as distribution cable to transmit signals for indoor applications.

Due to usage of HFFR type material in its construction, cable does not burn easily avoiding the spread of fire, it does not produce dangerous gas combination resulting with closed vision after burning and thus, can be safely used in buildings like hospitals, cinemas and schools where lots of people may become there.

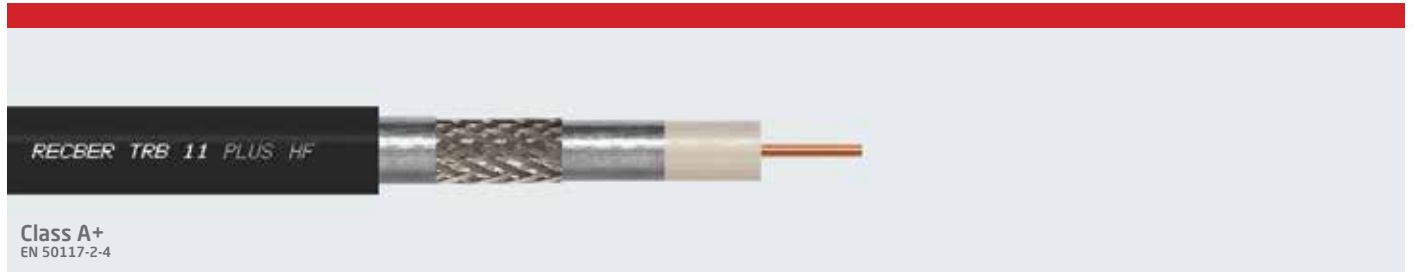
Technical information

Temperature range	-30 °C ... +70 °C	Attenuation @20 °C	50 MHz	4,30 dB/100m
Min. bending radius	10 x D		200 MHz	8,40 dB/100m
			470 MHz	13,0 dB/100m
Impedance	75 ± 3 Ω		860 MHz	18,0 dB/100m
Capacitance	52 ± 2 pF/m		1000 MHz	19,5 dB/100m
Velocity of propagation	%86 ± 2		2150 MHz	29,7 dB/100m
Insulation resistance	≥ 2 G Ω x km		2400 MHz	31,7 dB/100m
Max. operating voltage	1300 V		3000 MHz	36,0 dB/100m
Test voltage	3000 V			
Standards	EN 50117, IEC 61196	Return loss ¹⁾	5-470 MHz	> 23 dB
Features			470-1000MHz	> 20 dB
Vertical flame propagation	EN 60332-1-2		1000-2000 MHz	> 18 dB
Corrosive gas measurement	EN 50267-2-1/2		2000-3000 MHz	> 16 dB
Smoke density	EN 61034-2			
		Screening attenuation	30-1000MHz	≥ 95 dB
			1000-2000 MHz	≥ 85 dB
			2000-3000 MHz	≥ 75 dB
		Transfer impedance	5-30MHz	≤ 2,5 mΩ/m
		Screening class		Class A+

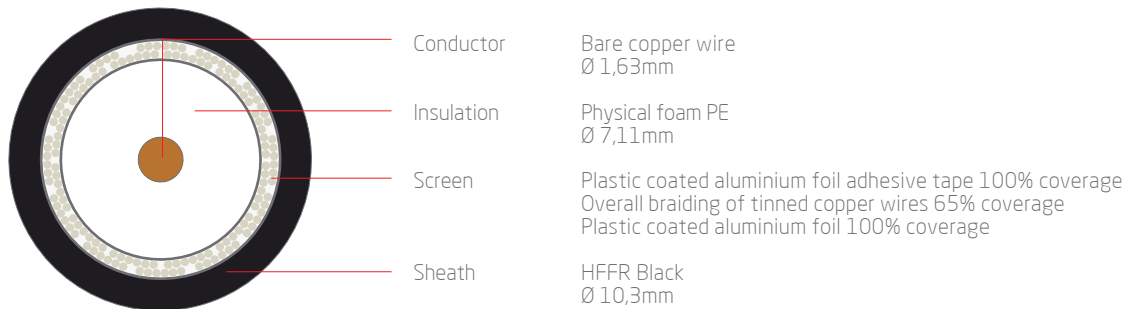
¹⁾ According to EN 50117, in each frequency band, 3 peak return loss values up to 4 dB lower than the stated specified limit are permissible.


 Low Voltage Directive 2006/95/EC
 EC Directive 2011/65/EU

Part no.	Cable construction	Outer dia. approx. [mm]	Cu content [kg/km]	Cable weight [kg/km]	Sheath - Color	Packing [m]
307175	TRB 120 Plus HF	6,90	22	53	Black (RAL 9011)	100/500/1000
307176	TRB 120 Plus HF	6,90	22	53	Lila (RAL 4005)	100/500/1000



Cable construction



Application

In CATV distribution broadcasts, the cable operating range 5-3000 MHz in compliance standards EN 50117, is designed for satellite and terrestrial broadcasting. Additionally, it can also be used as distribution cable or main cable to transmit signals for indoor applications.

Due to usage of HFFR type material in its construction, cable does not burn easily avoiding the spread of fire, it does not produce dangerous gas combination resulting with closed vision after burning and thus, can be safely used in buildings like hospitals, cinemas and schools where lots of people may become there.

Technical information

Temperature range	-30 °C ... +70 °C	Attenuation @20 °C	50 MHz	3,10 dB/100m
Min. bending radius	10 x D		200 MHz	6,20 dB/100m
			470 MHz	9,60 dB/100m
Impedance	75 ± 3 Ω		860 MHz	13,3 dB/100m
Capacitance	52,4 ± 2 pF/m		1000 MHz	14,4 dB/100m
Velocity of propagation	%85 ± 2		2150 MHz	22,3 dB/100m
Insulation resistance	≥ 2 G Ω x km		2400 MHz	23,7 dB/100m
Max. operating voltage	2000 V		3000 MHz	27,1 dB/100m
Test voltage	5000 V			
Standards	EN 50117, IEC 61196	Return loss ¹⁾	5-470 MHz	> 23 dB
Features			470-1000MHz	> 20 dB
Vertical flame propagation	EN 60332-1-2		1000-2000 MHz	> 18 dB
Corrosive gas measurement	EN 50267-2-1/2		2000-3000 MHz	> 16 dB
Smoke density	EN 61034-2			
		Screening attenuation	30-1000MHz	≥ 95 dB
			1000-2000 MHz	≥ 85 dB
			2000-3000 MHz	≥ 75 dB
		Transfer impedance	5-30MHz	≤ 2,5 mΩ/m
		Screening class		Class A+

¹⁾ According to EN 50117, in each frequency band, 3 peak return loss values up to 4 dB lower than the stated specified limit are permissible.



Part no.	Cable construction	Outer dia. approx. [mm]	Cu content [kg/km]	Cable weight [kg/km]	Sheath - Color	Packing [m]
307177	TRB 11 Plus HF	10,3	35	110	■ Black (RAL 9011)	500/1000

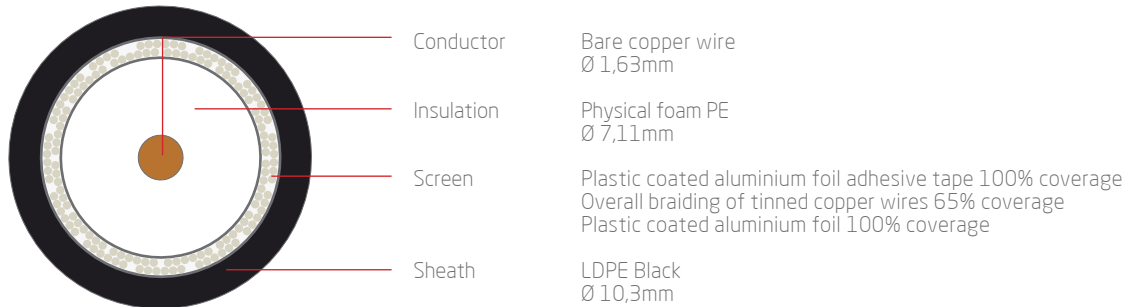
TRB 11 PE

75 Ohm HGV Coaxial Cable



Class A+
EN 50117-2-4

Cable construction



Application

In CATV distribution networks, the cable operating in the range 5-3000 MHz in compliance with the standards EN 50117, is designed for satellite and terrestrial broadcasting. Additionally, it can also be used as distribution cable or main cable to transmit signals for outdoor and underground applications.

Technical information

Temperature range	-30 °C ... +70 °C	Attenuation @20 °C	50 MHz	3,10 dB/100m
Min. bending radius	10 x D		200 MHz	6,20 dB/100m
			470 MHz	9,60 dB/100m
Impedance	75 ± 3 Ω		860 MHz	13,3 dB/100m
Capacitance	52,4 ± 2 pF/m		1000 MHz	14,4 dB/100m
Velocity of propagation	%85 ± 2		2150 MHz	22,3 dB/100m
Insulation resistance	≥ 2 G Ω x km		2400 MHz	23,7 dB/100m
Max. operating voltage	2000 V		3000 MHz	27,1 dB/100m
Test voltage	5000 V	Return loss ¹⁾	5-470 MHz	> 23 dB
Standards	EN 50117, IEC 61196		470-1000MHz	> 20 dB
			1000-2000 MHz	> 18 dB
			2000-3000 MHz	> 16 dB
		Screening attenuation	30-1000MHz	≥ 95 dB
			1000-2000 MHz	≥ 85 dB
			2000-3000 MHz	≥ 75 dB
		Transfer impedance	5-30MHz	≤ 2,5 mΩ/m
		Screening class	Class A+	

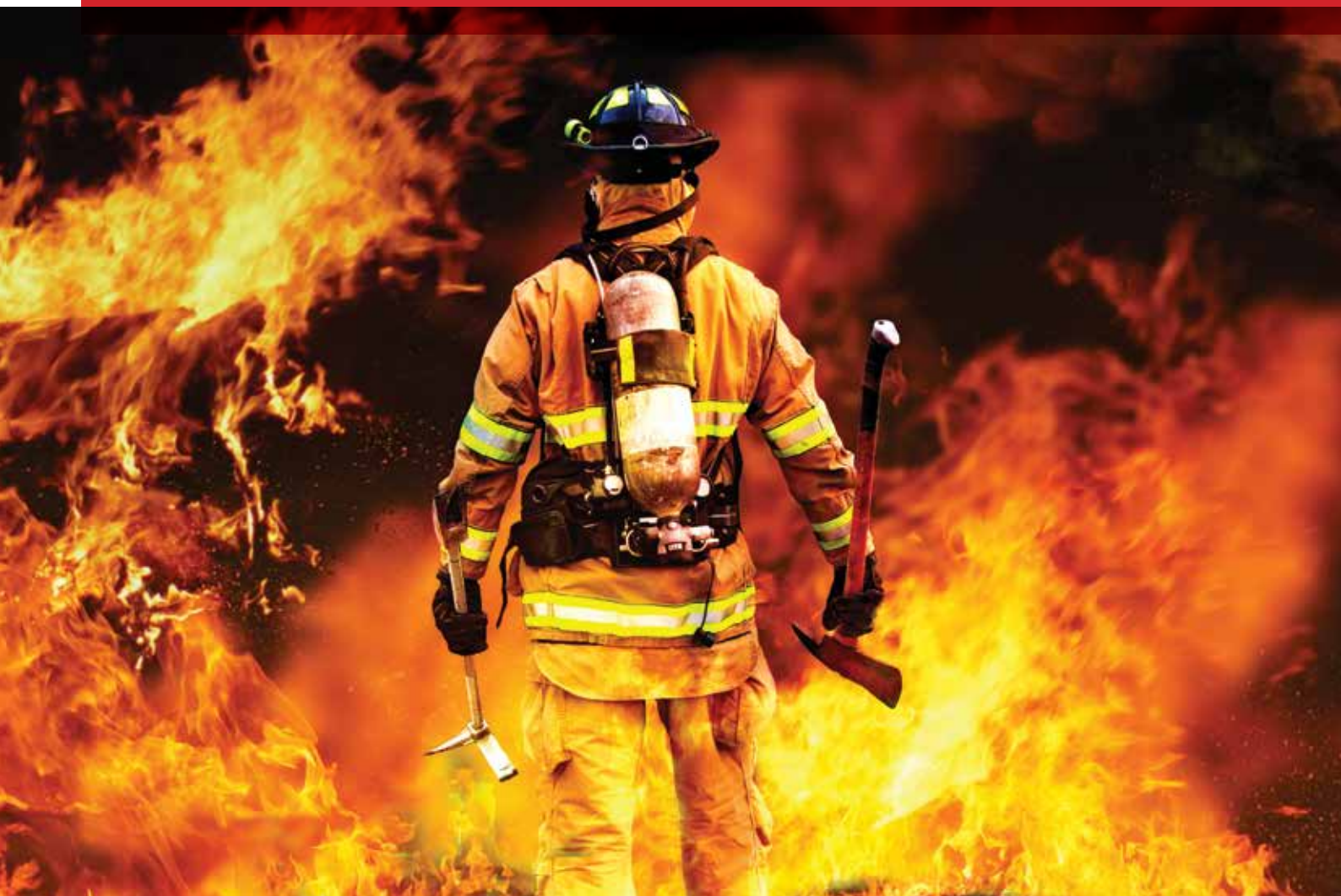
¹⁾ According to EN 50117, in each frequency band, 3 peak return loss values up to 4 dB lower than the stated specified limit are permissible.

Low Voltage Directive 2006/95/EC
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Part no.	Cable construction	Outer dia. approx. [mm]	Cu content [kg/km]	Cable weight [kg/km]	Sheath - Color	Packing [m]
307190	TRB 11 PE	10,3	35	85	■ Black (RAL 9011)	500/1000

FIRE RESISTANT

Cables







JE-H(St)H...Bd FE180 PH120

Fire alarm cables



Technical information

- Temperature range
flexible -5°C up to +50°C, fixed -30°C up to +70°C
- Minimum bending radius; 10x cable Ø
- Nominal voltage; 300 V
- Test voltage; 800 V
(core/core and core/screen)
- Mutual capacitance; 120nF/km
(for the cables up to 4 pair, this value may be increased by 20%)
- Capacitance unbalances; 200pF/100m
(20% of the values, but one value up to 400pF is allowed)
- Loop resistance @20°C
0,80mm - max. 73,2 Ohm/km
1,0mm² - max. 36,2 Ohm/km
1,5mm² - max. 24,2 Ohm/km
- Insulation resistance; min. 100 M.Ohm x km

Installation cable according to DIN VDE 0815

TSE	TSEK UBM-03-BK-023
VDE	DIN VDE 0815
CE	Low Voltage Directive 2006/95/EC
	RoHS compliant

Cable construction

- Annealed solid copper conductor; Ø 0,80, 1,12 and 1,37mm
- Special core insulation halogen-free cross-linked polymer; type HI1 acc. to DIN VDE 0207 part 23
- Core and pair identification acc. to DIN VDE 0815
- Cores twisted in pairs and pairs stranded together in layers with optimal lay-length (2-paired versions are stranded in star quad cable design)
- Polyester tape used as separator over cores
- Tinned copper drain wire Ø 0,80mm, electrostatic screen (St) of plastic coated aluminium foil
- Outer sheath HF compound; acc. to DIN VDE 0207 part 24 and acc. to EN 50290 2-27
- Outer sheath colour, Orange RAL 2003

Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Vertical flame spread acc. to, DIN VDE 0482-332-3-24, EN 60332 3-24, IEC 60332 3-24, Cat. C
- Corrosive gas measurement acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2
- **FE180:** Circuit integrity for 180 minutes under direct flame propagation acc. to DIN VDE 0472-814, IEC 60331
- **PH120:** Circuit integrity with shock for 120 minutes under direct flame propagation acc. to DIN VDE 0482-200, EN 50200

Application

These fire resistant halogen-free installation cables meet enhanced fire protection requirements concerning protection of people and high-value property. Do not emit any toxic or corrosive gases in the event of fire and resist the spread of fire. Used especially for installation in fire alarm systems. Thanks electrostatic screen and tin-plated drain wire, external electrical interferences of high frequency and electromagnetic field are minimized. Twisted pair structure minimizes crosstalk. For fixed installation on and under plaster, in dry and damp rooms. For outdoor use this cable should be installed under plaster only. Used for signal transmission in industrial applications, such as industrial complexes, public buildings, hotels, airports, under ground railway networks, hospitals.

Part No.	No. pairs x diameter [mm]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. pairs x cross-sec [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
112050	1x2x0,80	6,0	13,5	48	112057	1x2x1,0	6,8	22,2	56
112051	2x2x0,80	6,7	22,6	67	112058	2x2x1,0	7,6	40,0	84
112052	3x2x0,80	8,5	31,8	92	112071	1x2x1,5	7,6	30,6	71
112053	4x2x0,80	9,2	40,9	98	112072	2x2x1,5	8,5	56,9	111



Technical information

- Temperature range
flexible -5°C up to +50°C, fixed -30°C up to +70°C
- Minimum bending radius
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage
up to 1,5mm² 300/500 V
from 2,5mm² 450/750 V
- Test voltage
up to 1,5mm² 1500 V
from 2,5mm² 2500 V
- Conductor resistance @20°C
0,75mm² max. 26,0 Ohm/km
1,0mm² max. 19,5 Ohm/km
1,5mm² max. 13,3 Ohm/km
2,5mm² max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

Cable according to DIN VDE 0812

TSE VDE CE	TSEK UBM-03-BK-028 DIN VDE 0812 Low Voltage Directive 2006/95/EC RoHS compliant
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Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Special core insulation halogen-free cross-linked polymer; type HI1 acc. to DIN VDE 0207 part 23
- Colour coded acc. to DIN 47100 for more than 5 cores white core/black numbered
- Core stranded in layers with optimal lay-length
- Glass-fibre tape used as separator over cores
- Outer sheath HF compound; acc. to DIN VDE 0207 part 24 and acc. to EN 50290 2-27
- Outer sheath colour, Orange RAL 2003

Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Vertical flame spread acc. to, DIN VDE 0482-332-3-24, EN 60332 3-24, IEC 60332 3-24, Cat. C
- Corrosive gas measurement acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2
- **FE180:** Circuit integrity for 180 minutes under direct flame propagation acc. to DIN VDE 0472-814, IEC 60331
- **PH120:** Circuit integrity with shock for 120 minutes under direct flame propagation acc. to DIN VDE 0482-200, EN 50200

Application

These fire resistant halogen-free flexible cables meet enhanced fire protection requirements concerning protection of people and high-value property. Do not emit any toxic or corrosive gases in the event of fire and resist the spread of fire. Used for signal transmission in industrial applications, such as industrial complexes, public buildings, hotels, airports, under ground railway networks, hospitals.

Part No.	No. pairs x cross-sec [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. pairs x cross-sec [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
101104	2x0,75	5,1	12,2	39	101140	2x1,5	6,9	24,4	68
101105	3x0,75	5,9	18,4	48	101141	3x1,5	7,4	36,6	81
101106	4x0,75	6,5	24,5	61	101142	4x1,5	8,2	48,9	103
101107	5x0,75	7,1	30,7	76	101143	5x1,5	9,0	61,2	129
101108	6x0,75	7,8	36,8	92	101144	6x1,5	9,8	73,5	156
101109	7x0,75	7,8	43,0	97	101145	7x1,5	9,8	85,8	165
101110	8x0,75	9,2	49,3	128	101146	8x1,5	11,7	98,1	219
101111	10x0,75	10,0	61,6	141	101147	10x1,5	12,7	122,8	242
101112	12x0,75	10,3	73,9	160	101148	12x1,5	13,2	147,3	281
Part No.	No. pairs x cross-sec [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. pairs x cross-sec [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
101122	2x1,0	5,9	16,3	49	101158	2x2,5	7,9	40,7	95
101123	3x1,0	6,3	24,5	58	101159	3x2,5	8,3	61,1	114
101124	4x1,0	6,9	32,7	72	101160	4x2,5	9,3	81,4	148
101125	5x1,0	7,5	40,9	90	101161	5x2,5	10,2	101,9	185
101126	6x1,0	8,3	49,2	109	101162	6x2,5	11,2	122,5	224
101127	7x1,0	8,3	57,4	115	101163	7x2,5	11,2	142,9	240
101128	8x1,0	9,8	65,7	152	101164	8x2,5	13,4	163,6	313
101129	10x1,0	10,7	82,2	170	101165	10x2,5	14,6	204,8	352
101130	12x1,0	11,0	98,5	194	101166	12x2,5	15,2	204,8	360



Technical information

- Temperature range
flexible -5°C up to +50°C, fixed -30°C up to +70°C
- Minimum bending radius
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage
up to 1,5mm² 300/500 V
from 2,5mm² 450/750 V
- Test voltage
up to 1,5mm² 1500 V
from 2,5mm² 2500 V
- Conductor resistance @20°C
0,75mm² max. 26,0 Ohm/km
1,0mm² max. 19,5 Ohm/km
1,5mm² max. 13,3 Ohm/km
2,5mm² max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

Cable according to DIN VDE 0812

TSE	TSEK UBM-03-BK-028
VDE	DIN VDE 0812
CE	Low Voltage Directive 2006/95/EC
	RoHS compliant

Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Special core insulation halogen-free cross-linked polymer; type HI1 acc. to DIN VDE 0207 part 23
- Colour coded acc. to DIN 47100 for more than 5 cores white core/ black numbered
- Core stranded in layers with optimal lay-length
- Glass-fibre tape used as separator over cores
- Overall braiding of tinned copper wires
- Outer sheath HF compound; acc. to DIN VDE 0207 part 24 and acc. to EN 50290 2-27
- Outer sheath colour, Orange RAL 2003

Features

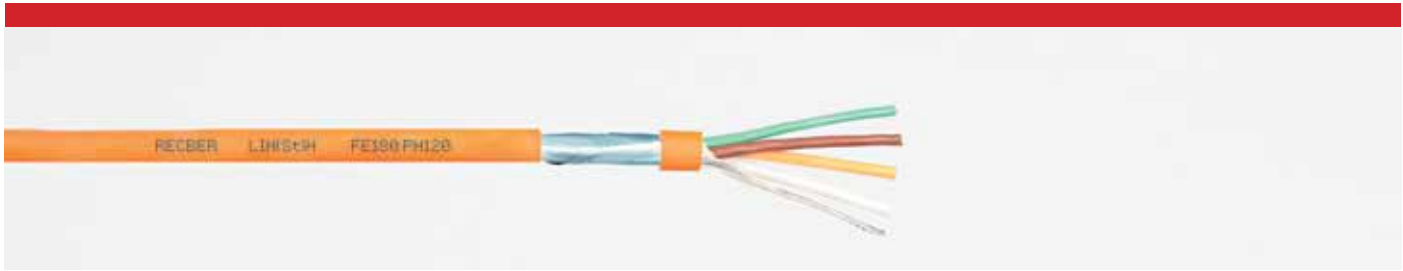
- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Vertical flame spread acc. to, DIN VDE 0482-332-3-24, EN 60332 3-24, IEC 60332 3-24, Cat. C
- Corrosive gas measurement acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2
- **FE180:** Circuit integrity for 180 minutes under direct flame propagation acc. to DIN VDE 0472-814, IEC 60331
- **PH120:** Circuit integrity with shock for 120 minutes under direct flame propagation acc. to DIN VDE 0482-200, EN 50200

Application

These fire resistant halogen-free flexible cables meet enhanced fire protection requirements concerning protection of people and high-value property. Do not emit any toxic or corrosive gases in the event of fire and resist the spread of fire. Used for signal transmission in industrial applications, such as industrial complexes, public buildings, hotels, airports, under ground railway networks, hospitals. The high density of the braiding assures disturbance-free transmission of all signals and impulses. This can be important when trying to ensure electromagnetic compatibility (EMC).

Part No.	No. pairs x cross-sec [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. pairs x cross-sec [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
102104	2x0,75	5,6	19,2	48	102140	2x1,5	6,9	32,8	77
102105	3x0,75	5,9	25,4	56	102141	3x1,5	7,4	46,3	91
102106	4x0,75	6,5	32,8	69	102142	4x1,5	8,1	58,8	113
102107	5x0,75	7,0	39,1	84	102143	5x1,5	8,9	72,5	141
102108	6x0,75	7,7	46,6	101	102144	6x1,5	9,7	86,3	169
102109	7x0,75	7,7	52,7	106	102145	7x1,5	9,7	98,6	179
102110	8x0,75	9,0	60,6	137	102146	8x1,5	11,5	114,2	235
102111	10x0,75	9,8	74,5	152	102147	10x1,5	12,5	139,4	259
102112	12x0,75	10,2	86,8	173	102148	12x1,5	13,0	166,2	300

Part No.	No. pairs x cross-sec [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. pairs x cross-sec [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
102122	2x1,0	5,9	23,4	56	102158	2x2,5	7,8	50,4	105
102123	3x1,0	6,2	31,6	64	102159	3x2,5	8,3	72,2	126
102124	4x1,0	6,9	41,1	81	102160	4x2,5	9,1	92,8	158
102125	5x1,0	7,5	50,6	100	102161	5x2,5	10,0	114,8	197
102126	6x1,0	8,3	60,3	121	102162	6x2,5	11,1	136,4	238
102127	7x1,0	8,3	68,5	127	102163	7x2,5	11,1	156,9	255
102128	8x1,0	9,7	78,5	165	102164	8x2,5	13,2	180,5	330
102129	10x1,0	10,5	95,9	182	102165	10x2,5	14,3	224,5	371
102130	12x1,0	10,8	114,3	209	102166	12x2,5	14,9	265,8	429



Technical information

- Temperature range
flexible -5°C up to +50°C, fixed -30°C up to +70°C
- Minimum bending radius
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage
up to 1,5mm² 300/500 V
from 2,5mm² 450/750 V
- Test voltage
up to 1,5mm² 1500 V
from 2,5mm² 2500 V
- Conductor resistance @20°C
0,75mm² max. 26,0 Ohm/km
1,0mm² max. 19,5 Ohm/km
1,5mm² max. 13,3 Ohm/km
2,5mm² max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

Cable according to DIN VDE 0812

TSE VDE CE | TSEK UBM-03-BK-028
DIN VDE 0812
Low Voltage Directive 2006/95/EC
RoHS compliant

Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Special core insulation halogen-free cross-linked polymer; type HI1 acc. to DIN VDE 0207 part 23
- Colour coded acc. to DIN 47100 for more than 5 cores white core/black numbered
- Core stranded in layers with optimal lay-length
- Glass-fibre tape used as separator over cores
- Stranded tinned copper drain wire, electrostatic screen (St) of plastic coated aluminium foil
- Outer sheath HF compound; acc. to DIN VDE 0207 part 24 and acc. to EN 50290 2-27
- Outer sheath colour, Orange RAL 2003

Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Vertical flame spread acc. to, DIN VDE 0482-332-3-24, EN 60332 3-24, IEC 60332 3-24, Cat. C
- Corrosive gas measurement acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2
- **FE180:** Circuit integrity for 180 minutes under direct flame propagation acc. to DIN VDE 0472-814, IEC 60331
- **PH120:** Circuit integrity with shock for 120 minutes under direct flame propagation acc. to DIN VDE 0482-200, EN 50200

Application

These fire resistant halogen-free flexible cables meet enhanced fire protection requirements concerning protection of people and high-value property. Do not emit any toxic or corrosive gases in the event of fire and resist the spread of fire. Used for signal transmission in industrial applications, such as industrial complexes, public buildings, hotels, airports, under ground railway networks, hospitals. Electrostatic screen assures disturbance-free transmission of all signals and impulses. This can be important when trying to ensure electromagnetic compatibility (EMC).

Part No.	No. pairs x cross-sec [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. pairs x cross-sec [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
103104	2x0,75	5,7	16,7	47	103140	2x1,5	7,1	28,8	75
103105	3x0,75	6,0	22,8	54	103141	3x1,5	7,5	41,1	87
103106	4x0,75	6,6	29,0	67	103142	4x1,5	8,3	53,4	110
103107	5x0,75	7,2	35,1	83	103143	5x1,5	9,2	65,7	138
103108	6x0,75	7,9	41,3	98	103144	6x1,5	10,0	78,0	165
103109	7x0,75	7,9	47,4	103	103145	7x1,5	10,0	90,3	175
103110	8x0,75	9,3	53,7	134	103146	8x1,5	11,8	102,6	226
103111	10x0,75	10,1	66,1	147	103147	10x1,5	12,9	127,3	252
103112	12x0,75	10,4	78,4	167	103148	12x1,5	13,3	151,8	289

Part No.	No. pairs x cross-sec [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. pairs x cross-sec [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
103122	2x1,0	6,0	20,8	55	103158	2x2,5	8,0	45,1	102
103123	3x1,0	6,4	28,9	64	103159	3x2,5	8,5	65,5	122
103124	4x1,0	7,1	37,1	80	103160	4x2,5	9,4	85,9	154
103125	5x1,0	7,6	45,4	96	103161	5x2,5	10,3	106,4	192
103126	6x1,0	8,5	53,6	118	103162	6x2,5	11,4	127,0	233
103127	7x1,0	8,5	61,8	124	103163	7x2,5	11,4	147,4	250
103128	8x1,0	10,0	70,1	161	103164	8x2,5	13,6	168,1	324
103129	10x1,0	10,8	86,6	177	103165	10x2,5	14,7	209,3	360
103130	12x1,0	11,1	103,0	201	103166	12x2,5	15,3	250,3	419



Technical information

- Temperature range
flexible -5°C up to +50°C, fixed -30°C up to +70°C
- Minimum bending radius
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage
up to 1,5mm² 300/500 V
from 2,5mm² 450/750 V
- Test voltage
up to 1,5mm² 1500 V
from 2,5mm² 2500 V
- Conductor resistance @20°C
0,75mm² max. 26,0 Ohm/km
1,0mm² max. 19,5 Ohm/km
1,5mm² max. 13,3 Ohm/km
2,5mm² max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

Cable according to DIN VDE 0812

TSE	TSEK UBM-03-BK-028
ANSI	DDIN VDE 0812
CE	Low Voltage Directive 2006/95/EC
	RoHS compliant

Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Special core insulation halogen-free cross-linked polymer; type HI1 acc. to DIN VDE 0207 part 23
- Colour coded acc. to DIN 47100 for more than 5 cores white core/ black numbered
- Core stranded in layers with optimal lay-length
- Glass-fibre tape used as separator over cores
- Electrostatic screen (St) of plastic coated aluminium foil
- Overall braiding of tinned copper wires
- Outer sheath HF compound; acc. to DIN VDE 0207 part 24 and acc. to EN 50290 2-27
- Outer sheath colour, Orange RAL 2003

Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Vertical flame spread acc. to, DIN VDE 0482-332-3-24, EN 60332 3-24, IEC 60332 3-24, Cat. C
- Corrosive gas measurement acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2
- **FE180:** Insulation integrity for 180 minutes under direct flame propagation acc. to DIN VDE 0472-814, IEC 60331
- **PH120:** Circuit integrity with shock for 120 minutes under direct flame propagation acc. to DIN VDE 0482-200, EN 50200

Application

These fire resistant halogen-free flexible cables meet enhanced fire protection requirements concerning protection of people and high-value property. Do not emit any toxic or corrosive gases in the event of fire and resist the spread of fire. Used for signal transmission in industrial applications, such as industrial complexes, public buildings, hotels, airports, under ground railway networks, hospitals. Electrostatic screen and the high density of the braiding assure disturbance-free transmission of all signals and impulses. This can be important when trying to ensure electromagnetic compatibility. (EMC)

Part No.	No. pairs x diameter [mm]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. pairs x diameter [mm]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
104104	2x0,75	6,3	19,3	53	104140	2x1,0	6,6	23,4	61
104105	3x0,75	6,6	25,5	61	104141	3x1,0	6,9	31,6	69
104106	4x0,75	7,2	31,7	74	104142	4x1,0	7,6	41,1	86
104107	5x0,75	7,8	39,1	90	104143	5x1,0	8,2	49,5	105
104108	6x0,75	8,5	45,4	107	104144	6x1,0	9,0	59,1	126
104109	7x0,75	8,5	51,5	112	104145	7x1,0	9,0	67,3	132
104110	8x0,75	9,8	59,4	143	104146	8x1,0	10,5	77,2	170
104111	10x0,75	10,7	73,2	159	104147	10x1,0	11,4	94,0	190
104112	12x0,75	11,0	85,6	179	104148	12x1,0	11,7	110,4	214

Part No.	No. pairs x diameter [mm]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. pairs x diameter [mm]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
104122	2x1,5	7,6	32,8	81	104158	2x2,5	8,6	49,2	110
104123	3x1,5	8,1	45,1	95	104159	3x2,5	9,0	71,0	130
104124	4x1,5	8,9	58,8	119	104160	4x2,5	10,0	91,6	165
104125	5x1,5	9,7	71,3	146	104161	5x2,5	10,9	113,6	204
104126	6x1,5	10,5	85,1	175	104162	6x2,5	11,9	135,8	245
104127	7x1,5	10,5	97,4	184	104163	7x2,5	11,9	156,3	261
104128	8x1,5	12,4	111,6	241	104164	8x2,5	14,1	177,8	336
104129	10x1,5	13,4	136,7	264	104165	10x2,5	15,3	222,4	380
104130	12x1,5	13,9	162,1	305	104166	12x2,5	15,9	263,6	440

SIGNAL AND CONTROL

Cables









Technical information

- Temperature range flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Minimum bending radius flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage up to 1,5mm² 300/500 V from 2,5mm² 450/750 V
- Test voltage up to 1,5mm² 1500 V from 2,5mm² 2500 V
- Conductor resistance @20°C 0,22mm² max. 85,0 Ohm/km 0,50mm² max. 39,0 Ohm/km 0,75mm² max. 26,0 Ohm/km 1,0mm² max. 19,5 Ohm/km 1,5mm² max. 13,3 Ohm/km 2,5mm² max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

Cable according to DIN VDE 0812

Application

These flexible cables are used for signal transmission in industrial applications. (with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air) Main application ranges are tool making, machine industries, electronic, measurement and control sectors, computer or audio systems or in communication sector.

Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation PVC compound; type YI2 acc. to DIN VDE 0207 part 4, type TI52 acc. to EN 50290 2-21
- Colour coded acc. to DIN 47100
- Core stranded in layers with optimal lay-length
- Polyester tape used as separator over cores
- Outer sheath, flame resistant PVC compound; type YM1 acc. to DIN VDE 0207 part 5, type TM51 acc. to EN 50290 2-22
- Outer sheath colour, Grey RAL 7001

Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2

TSE | TSEK UBM-03-BK-022
VDE | DIN VDE 0812
CE | Low Voltage Directive 2006/95/EC
RoHS compliant

Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
201050	2x0,22	3,5	3,6	15	201122	2x1,0	5,4	16,3	41
201051	3x0,22	3,9	5,4	18	201123	3x1,0	5,7	24,5	48
201052	4x0,22	4,2	7,2	22	201124	4x1,0	6,5	32,7	64
201053	5x0,22	4,5	8,9	27	201125	5x1,0	7,0	40,9	79
201054	6x0,22	4,9	10,8	32	201126	6x1,0	7,7	49,2	96
201055	7x0,22	4,9	12,6	34	201127	7x1,0	7,7	57,4	102
201056	8x0,22	5,7	14,3	44	201128	8x1,0	9,2	65,7	136
201057	10x0,22	6,1	18,0	46	201129	10x1,0	9,9	82,2	147
201058	12x0,22	6,5	21,5	56	201130	12x1,0	10,2	98,5	171

Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
201086	2x0,50	4,7	8,2	28	201140	2x1,5	6,5	24,4	60
201087	3x0,50	4,9	12,3	32	201141	3x1,5	6,9	36,6	71
201088	4x0,50	5,4	16,3	40	201142	4x1,5	7,6	48,9	90
201089	5x0,50	5,9	20,4	49	201143	5x1,5	8,3	61,2	113
201090	6x0,50	6,6	24,5	62	201144	6x1,5	9,2	73,5	140
201091	7x0,50	6,6	28,6	65	201145	7x1,5	9,2	85,8	149
201092	8x0,50	7,7	32,8	85	201146	8x1,5	10,8	98,1	192
201093	10x0,50	8,3	41,1	90	201147	10x1,5	11,9	122,8	215
201094	12x0,50	8,6	49,2	104	201148	12x1,5	12,3	147,3	250

Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
201104	2x0,75	5,1	12,2	34	201158	2x2,5	7,3	40,7	83
201105	3x0,75	5,4	18,4	41	201159	3x2,5	7,7	61,1	100
201106	4x0,75	5,9	24,5	51	201160	4x2,5	8,5	81,4	129
201107	5x0,75	6,6	30,7	67	201161	5x2,5	9,5	101,9	166
201108	6x0,75	7,2	36,8	79	201162	6x2,5	10,4	122,5	200
201109	7x0,75	7,2	43,0	84	201163	7x2,5	10,4	142,9	217
201110	8x0,75	8,4	49,3	109	201164	8x2,5	12,5	163,6	282
201111	10x0,75	9,3	61,6	122	201165	10x2,5	13,5	204,8	312
201112	12x0,75	9,6	73,9	141	201166	12x2,5	14,0	245,8	366



Technical information

- Temperature range flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Minimum bending radius flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage up to 1,5mm² 300/500 V from 2,5mm² 450/750 V
- Test voltage up to 1,5mm² 1500 V from 2,5mm² 2500 V
- Conductor resistance @20°C 0,22mm² max. 85,0 Ohm/km 0,50mm² max. 39,0 Ohm/km 0,75mm² max. 26,0 Ohm/km 1,0mm² max. 19,5 Ohm/km 1,5mm² max. 13,3 Ohm/km 2,5mm² max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

Cable according to DIN VDE 0812

Application

These flexible cables are used for signal transmission in industrial applications. (with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air) Main application ranges are tool making, machine industries, electronic, measurement and control sectors, computer or audio systems or in communication sector. The high density of the braiding assures disturbance-free transmission of all signals and impulses. This can be important when trying to ensure electromagnetic compatibility. (EMC)

Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation PVC compound; type YI2 acc. to DIN VDE 0207 part 4, type TI52 acc. to EN 50290 2-21
- Colour coded acc. to DIN 47100
- Core stranded in layers with optimal lay-length
- Polyester tape used as separator over cores
- Overall braiding of tinned copper wires
- Outer sheath, flame resistant PVC compound; type YM1 acc. to DIN VDE 0207 part 5, type TM51 acc. to EN 50290 2-22
- Outer sheath colour, Grey RAL 7001

Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2

TSE	TSEK UBM-03-BK-022
VDE	DIN VDE 0812
CE	Low Voltage Directive 2006/95/EC
	RoHS compliant

Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
203050	2x0,22	4,2	8,1	23	203122	2x1,0	5,9	23,4	49
203051	3x0,22	4,4	9,9	24	203123	3x1,0	6,2	31,5	57
203052	4x0,22	4,7	11,8	28	203124	4x1,0	7,0	41,0	74
203053	5x0,22	5,0	14,7	34	203125	5x1,0	7,5	50,6	91
203054	6x0,22	5,4	16,6	39	203126	6x1,0	8,2	60,2	109
203055	7x0,22	5,4	18,4	41	203127	7x1,0	8,2	68,4	115
203056	8x0,22	6,2	22,6	53	203128	8x1,0	9,7	78,4	150
203057	10x0,22	6,8	26,3	59	203129	10x1,0	10,4	95,8	163
203058	12x0,22	7,0	29,9	66	203130	12x1,0	10,7	112,3	186

Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
203086	2x0,50	5,2	14,0	35	203140	2x1,5	7,0	32,7	70
203087	3x0,50	5,4	18,1	39	203141	3x1,5	7,4	46,3	82
203088	4x0,50	5,9	23,4	48	203142	4x1,5	8,1	58,7	101
203089	5x0,50	6,6	28,7	62	203143	5x1,5	8,8	72,5	125
203090	6x0,50	7,1	32,9	72	203144	6x1,5	9,7	86,3	154
203091	7x0,50	7,1	37,0	75	203145	7x1,5	9,7	98,5	164
203092	8x0,50	8,2	43,9	97	203146	8x1,5	11,3	114,1	210
203093	10x0,50	8,8	52,3	103	203147	10x1,5	12,4	139,3	234
203094	12x0,50	9,3	60,6	122	203148	12x1,5	12,8	164,0	269

Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
203104	2x0,75	5,6	19,2	42	203158	2x2,5	7,8	50,4	94
203105	3x0,75	5,9	25,4	49	203159	3x2,5	8,2	72,1	113
203106	4x0,75	6,6	32,8	64	203160	4x2,5	9,2	92,7	146
203107	5x0,75	7,1	39,0	77	203161	5x2,5	10,0	114,8	181
203108	6x0,75	7,7	46,5	91	203162	6x2,5	10,9	136,4	216
203109	7x0,75	7,7	52,7	95	203163	7x2,5	10,9	156,8	232
203110	8x0,75	8,9	60,5	122	203164	8x2,5	13,0	180,4	300
203111	10x0,75	9,8	74,4	137	203165	10x2,5	14,0	224,4	333
203112	12x0,75	10,1	86,8	156	203166	12x2,5	14,5	265,6	387

Dimensions and specifications may be changed without prior notice.



Technical information

- Temperature range
flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Minimum bending radius
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage
up to 1,5mm² 300/500 V
from 2,5mm² 450/750 V
- Test voltage
up to 1,5mm² 1500 V
from 2,5mm² 2500 V
- Conductor resistance @20°C
0,22mm² max. 85,0 Ohm/km
0,50mm² max. 39,0 Ohm/km
0,75mm² max. 26,0 Ohm/km
1,0mm² max. 19,5 Ohm/km
1,5mm² max. 13,3 Ohm/km
2,5mm² max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

Cable according to DIN VDE 0812

Application

These flexible cables are used for signal transmission in industrial applications. (with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air) Main application ranges are tool making, machine industries, electronic, measurement and control sectors, computer or audio systems or in communication sector. Electrostatic screen assures disturbance-free transmission of all signals and impulses. This can be important when trying to ensure electromagnetic compatibility. (EMC)

Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation PVC compound; type YI2 acc. to DIN VDE 0207 part 4, type TI52 acc. to EN 50290 2-21
- Colour coded acc. to DIN 47100
- Core stranded in layers with optimal lay-length
- Polyester tape used as separator over cores
- Stranded tinned copper drain wire, electrostatic screen (St) of plastic coated aluminium foil
- Outer sheath, flame resistant PVC compound; type YM1 acc. to DIN VDE 0207 part 5, type TM51 acc. to EN 50290 2-22
- Outer sheath colour, Grey RAL 7001

Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2

TSE | TSEK UBM-03-BK-022
VDE | DIN VDE 0812
CE | Low Voltage Directive 2006/95/EC
RoHS compliant

Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
205050	2x0,22	3,9	5,3	20	205122	2x1,0	5,6	20,8	47
205051	3x0,22	4,1	7,1	21	205123	3x1,0	5,9	28,9	54
205052	4x0,22	4,4	9,0	25	205124	4x1,0	6,7	37,1	70
205053	5x0,22	4,7	10,7	30	205125	5x1,0	7,2	45,4	86
205054	6x0,22	5,1	12,6	35	205126	6x1,0	7,9	53,6	103
205055	7x0,22	5,1	14,4	37	205127	7x1,0	7,9	61,8	109
205056	8x0,22	5,9	16,1	47	205128	8x1,0	9,4	70,1	143
205057	10x0,22	6,5	19,8	53	205129	10x1,0	10,1	86,6	154
205058	12x0,22	6,7	23,3	59	205130	12x1,0	10,4	103,0	178
Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
205086	2x0,50	4,9	9,9	31	205140	2x1,5	6,7	28,8	66
205087	3x0,50	5,1	14,0	35	205141	3x1,5	7,1	41,1	77
205088	4x0,50	5,6	18,1	43	205142	4x1,5	7,8	53,4	97
205089	5x0,50	6,1	22,2	53	205143	5x1,5	8,5	65,7	119
205090	6x0,50	6,8	26,3	66	205144	6x1,5	9,4	78,0	147
205091	7x0,50	6,8	30,4	69	205145	7x1,5	9,4	90,3	156
205092	8x0,50	7,9	34,6	89	205146	8x1,5	11,0	102,6	200
205093	10x0,50	8,5	42,9	95	205147	10x1,5	12,1	127,3	223
205094	12x0,50	8,8	51,0	109	205148	12x1,5	12,5	151,8	258
Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
205104	2x0,75	5,3	16,7	40	205158	2x2,5	7,5	45,1	89
205105	3x0,75	5,6	22,8	47	205159	3x2,5	7,9	65,5	107
205106	4x0,75	6,1	29,0	57	205160	4x2,5	8,7	85,9	135
205107	5x0,75	6,8	35,1	73	205161	5x2,5	9,7	106,4	173
205108	6x0,75	7,4	41,3	86	205162	6x2,5	10,6	127,0	207
205109	7x0,75	7,4	47,4	91	205163	7x2,5	10,6	147,4	224
205110	8x0,75	8,6	53,7	115	205164	8x2,5	12,7	168,1	289
205111	10x0,75	9,5	66,1	129	205165	10x2,5	13,7	209,3	320
205112	12x0,75	9,8	78,4	148	205166	12x2,5	14,2	250,3	374



Technical information

- Temperature range
flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Minimum bending radius
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage
up to 1,5mm² 300/500 V
from 2,5mm² 450/750 V
- Test voltage
up to 1,5mm² 1500 V
from 2,5mm² 2500 V
- Conductor resistance @20°C
0,22mm² max. 85,0 Ohm/km
0,50mm² max. 39,0 Ohm/km
0,75mm² max. 26,0 Ohm/km
1,0mm² max. 19,5 Ohm/km
1,5mm² max. 13,3 Ohm/km
2,5mm² max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

Cable according to DIN VDE 0812

Application

These flexible cables are used for signal transmission in industrial applications. (with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air) Main application ranges are tool making, machine industries, electronic, measurement and control sectors, computer or audio systems or in communication sector. Electrostatic screen and the high density of the braiding assure disturbance-free transmission of all signals and impulses. This can be important when trying to ensure electromagnetic compatibility. (EMC)

Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation PVC compound; type YI2 acc. to DIN VDE 0207 part 4, type TI52 acc. to EN 50290 2-21
- Colour coded acc. to DIN 47100
- Core stranded in layers with optimal lay-length
- Electrostatic screen (St) of plastic coated aluminium foil used as separator over cores
- Overall braiding of tinned copper wires
- Outer sheath, flame resistant PVC compound; type YM1 acc. to DIN VDE 0207 part 5, type TM51 acc. to EN 50290 2-22
- Outer sheath colour, Grey RAL 7001

Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2

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VDE	DIN VDE 0812
CE	Low Voltage Directive 2006/95/EC
	RoHS compliant

Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
207050	2x0,22	7,0	7,0	22	207122	2x1,0	5,9	22,2	49
207051	3x0,22	8,8	8,8	24	207123	3x1,0	6,2	30,4	56
207052	4x0,22	11,8	11,8	29	207124	4x1,0	7,0	39,8	73
207053	5x0,22	13,6	13,6	34	207125	5x1,0	7,5	48,2	89
207054	6x0,22	16,6	16,6	40	207126	6x1,0	8,2	57,8	107
207055	7x0,22	18,4	18,4	41	207127	7x1,0	8,2	66,0	113
207056	8x0,22	20,2	20,2	51	207128	8x1,0	9,7	75,9	148
207057	10x0,22	25,1	25,1	58	207129	10x1,0	10,4	93,9	162
207058	12x0,22	28,7	28,7	64	207130	12x1,0	10,4	110,3	184
Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
207086	2x0,50	5,2	12,8	34	207141	2x1,5	7,0	31,6	69
207087	3x0,50	5,4	16,9	38	207142	3x1,5	7,4	43,9	80
207088	4x0,50	5,9	22,2	47	207143	4x1,5	8,1	57,5	101
207089	5x0,50	6,6	27,6	61	207144	5x1,5	8,8	71,2	125
207090	6x0,50	7,1	31,7	71	207145	6x1,5	9,7	83,7	153
207091	7x0,50	7,1	35,8	74	207146	7x1,5	9,7	96,0	162
207092	8x0,50	8,2	41,5	96	207147	8x1,5	11,3	110,2	207
207093	10x0,50	8,8	49,8	102	207148	10x1,5	12,4	136,6	232
207094	12x0,50	8,8	58,0	115	207149	12x1,5	12,4	161,1	265
Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
207104	2x0,75	5,6	18,1	42	207158	2x2,5	7,8	49,2	94
207105	3x0,75	5,9	24,2	48	207159	3x2,5	8,2	69,7	111
207106	4x0,75	6,6	31,6	63	207160	4x2,5	9,2	91,5	145
207107	5x0,75	7,1	37,8	76	207161	5x2,5	10,0	112,2	179
207108	6x0,75	7,7	45,3	90	207162	6x2,5	10,9	134,4	215
207109	7x0,75	7,7	51,5	95	207163	7x2,5	10,9	154,8	231
207110	8x0,75	8,9	59,3	121	207164	8x2,5	13,0	177,6	299
207111	10x0,75	9,8	71,9	135	207165	10x2,5	14,0	220,0	330
207112	12x0,75	9,8	84,2	153	207166	12x2,5	14,0	261,0	382



Technical information

- Temperature range
flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Minimum bending radius
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage
up to 1,5mm² 300/500 V
from 2,5mm² 450/750 V
- Test voltage
up to 1,5mm² 1500 V
from 2,5mm² 2500 V
- Conductor resistance @20°C
0,22mm² max. 85,0 Ohm/km
0,50mm² max. 39,0 Ohm/km
0,75mm² max. 26,0 Ohm/km
1,0mm² max. 19,5 Ohm/km
1,5mm² max. 13,3 Ohm/km
2,5mm² max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

Cable according to DIN VDE 0812

Application

These flexible cables are used for signal transmission in industrial applications. (with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air) Twisted pair structure minimizes crosstalk. Main application ranges are tool making, machine industries, electronic, measurement and control sectors, computer or audio systems or in communication sector.

Part No.	No. pairs x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. pairs x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
209086	2x2x0,50	7,3	16,4	48	209122	2x2x1,0	8,5	32,8	71
209087	3x2x0,50	7,7	24,6	62	209123	3x2x1,0	9,2	49,3	99
209088	4x2x0,50	8,5	32,9	78	209124	4x2x1,0	10,1	65,7	125
209089	5x2x0,50	9,5	41,1	98	209125	5x2x1,0	11,1	82,2	152
Part No.	No. pairs x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. pairs x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
209104	2x2x0,75	8,0	24,6	60	209140	2x2x1,5	10,2	49,1	103
209105	3x2x0,75	8,4	36,9	79	209141	3x2x1,5	10,8	73,6	139
209106	4x2x0,75	9,5	49,2	105	209142	4x2x1,5	12,2	98,2	183
209107	5x2x0,75	10,4	61,6	126	209143	5x2x1,5	13,4	122,8	221

Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation PVC compound; type YI2 acc. to DIN VDE 0207 part 4, type TI52 acc. to EN 50290 2-21
- Core and pair identification acc. to DIN 47100
- Cores twisted in pairs and pairs stranded together in layers with optimal lay-length
- Polyester tape used as separator over cores
- Outer sheath, flame resistant PVC compound; type YM1 acc. to DIN VDE 0207 part 5, type TM51 acc. to EN 50290 2-22
- Outer sheath colour, Grey RAL 7001

Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2

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Technical information

- Temperature range
flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Minimum bending radius
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage
up to 1,5mm² 300/500 V
from 2,5mm² 450/750 V
- Test voltage
up to 1,5mm² 1500 V
from 2,5mm² 2500 V
- Conductor resistance @20°C
0,22mm² max. 85,0 Ohm/km
0,50mm² max. 39,0 Ohm/km
0,75mm² max. 26,0 Ohm/km
1,0mm² max. 19,5 Ohm/km
1,5mm² max. 13,3 Ohm/km
2,5mm² max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

Cable according to DIN VDE 0812

Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation PVC compound; type YI2 acc. to DIN VDE 0207 part 4, type TI52 acc. to EN 50290 2-21
- Core and pair identification acc. to DIN 47100
- Cores twisted in pairs and pairs stranded together in layers with optimal lay-length
- Polyester tape used as separator over cores
- Overall braiding of tinned copper wires
- Outer sheath, flame resistant PVC compound; type YM1 acc. to DIN VDE 0207 part 5, type TM51 acc. to EN 50290 2-22
- Outer sheath colour, Grey RAL 7001

Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2

TSE | TSEK UBM-03-BK-022
 VDE | DIN VDE 0812
 CE | Low Voltage Directive 2006/95/EC
 | RoHS compliant

Application

These flexible cables are used for signal transmission in industrial applications. (with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air) Twisted pair structure minimizes crosstalk. Main application ranges are tool making, machine industries, electronic, measurement and control sectors, computer or audio systems or in communication sector. The high density of the braiding assures disturbance-free transmission of all signals and impulses. This can be important when trying to ensure electromagnetic compatibility. (EMC)

Part No.	No. pairs x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. pairs x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
211086	2x2x0,50	7,8	26,1	59	211122	2x2x1,0	9,2	44,1	88
211087	3x2x0,50	8,2	35,7	75	211123	3x2x1,0	9,7	62,0	114
211088	4x2x0,50	9,2	44,2	95	211124	4x2x1,0	10,6	79,4	141
211089	5x2x0,50	10,0	53,9	113	211125	5x2x1,0	11,6	98,4	170

Part No.	No. pairs x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. pairs x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
211104	2x2x0,75	8,5	35,8	73	211140	2x2x1,5	10,7	62,8	118
211105	3x2x0,75	8,9	48,2	92	211141	3x2x1,5	11,3	89,7	157
211106	4x2x0,75	10,0	62,1	119	211142	4x2x1,5	12,7	114,8	201
211107	5x2x0,75	10,9	75,5	142	211143	5x2x1,5	13,9	142,3	243



Technical information

- Temperature range
flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Minimum bending radius
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage
up to 1,5mm² 300/500 V
from 2,5mm² 450/750 V
- Test voltage
up to 1,5mm² 1500 V
from 2,5mm² 2500 V
- Conductor resistance @20°C
0,22mm² max. 85,0 Ohm/km
0,50mm² max. 39,0 Ohm/km
0,75mm² max. 26,0 Ohm/km
1,0mm² max. 19,5 Ohm/km
1,5mm² max. 13,3 Ohm/km
2,5mm² max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

Cable according to DIN VDE 0812

Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation PVC compound; type YI2 acc. to DIN VDE 0207 part 4, type TI52 acc. to EN 50290 2-21
- Core and pair identification acc. to DIN 47100
- Cores twisted in pairs and pairs stranded together in layers with optimal lay-length
- Polyester tape used as separator over cores
- Stranded tinned copper drain wire, electrostatic screen (St) of plastic coated aluminium foil
- Outer sheath, flame resistant PVC compound; type YM1 acc. to DIN VDE 0207 part 5, type TM51 acc. to EN 50290 2-22
- Outer sheath colour, Grey RAL 7001

Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2

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 VDE | DIN VDE 0812
 CE | Low Voltage Directive 2006/95/EC
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Application

These flexible cables are used for signal transmission in industrial applications. (with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air) Twisted pair structure minimizes crosstalk. Main application ranges are tool making, machine industries, electronic, measurement and control sectors, computer or audio systems or in communication sector. Electrostatic screen assures disturbance-free transmission of all signals and impulses. This can be important when trying to ensure electromagnetic compatibility. (EMC)

Part No.	No. pairs x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. pairs x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
213086	2x2x0,50	7,5	18,2	52	213122	2x2x1,0	8,7	37,3	78
213087	3x2x0,50	7,9	26,4	66	213123	3x2x1,0	9,4	53,7	106
213088	4x2x0,50	8,7	34,6	82	213124	4x2x1,0	10,3	70,2	133
213089	5x2x0,50	9,7	42,9	103	213125	5x2x1,0	11,3	86,6	159

Part No.	No. pairs x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. pairs x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
213104	2x2x0,75	8,2	29,1	67	213140	2x2x1,5	10,4	53,5	110
213105	3x2x0,75	8,6	41,4	86	213141	3x2x1,5	11,0	78,1	146
213106	4x2x0,75	9,7	53,7	112	213142	4x2x1,5	12,4	102,6	190
213107	5x2x0,75	10,6	66,1	133	213143	5x2x1,5	13,6	127,3	229



Technical information

- Temperature range
flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Minimum bending radius
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage
up to 1,5mm² 300/500 V
from 2,5mm² 450/750 V
- Test voltage
up to 1,5mm² 1500 V
from 2,5mm² 2500 V
- Conductor resistance @20°C
0,22mm² max. 85,0 Ohm/km
0,50mm² max. 39,0 Ohm/km
0,75mm² max. 26,0 Ohm/km
1,0mm² max. 19,5 Ohm/km
1,5mm² max. 13,3 Ohm/km
2,5mm² max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

Cable according to DIN VDE 0812

Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation PVC compound; type YI2 acc. to DIN VDE 0207 part 4, type TI52 acc. to EN 50290 2-21
- Core and pair identification acc. to DIN 47100
- Cores twisted in pairs and pairs stranded together in layers with optimal lay-length
- Electrostatic screen (St) of plastic coated aluminium foil used as separator over cores
- Overall braiding of tinned copper wires
- Outer sheath, flame resistant PVC compound; type YM1 acc. to DIN VDE 0207 part 5, type TM51 acc. to EN 50290 2-22
- Outer sheath colour, Grey RAL 7001

Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2

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 VDE | DIN VDE 0812
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 RoHS compliant

Application

These flexible cables are used for signal transmission in industrial applications. (with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air). Twisted pair structure minimizes crosstalk. Main application ranges are tool making, machine industries, electronic, measurement and control sectors, computer or audio systems or in communication sector. Electrostatic screen and the high density of the braiding assure disturbance-free transmission of all signals and impulses. This can be important when trying to ensure electromagnetic compatibility. (EMC)

Part No.	No. pairs x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. pairs x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
215086	2x2x0,50	7,8	26,2	60	215122	2x2x1,0	9,2	44,1	89
215087	3x2x0,50	8,2	35,7	76	215123	3x2x1,0	9,7	62,0	115
215088	4x2x0,50	9,2	44,2	96	215124	4x2x1,0	10,6	79,5	142
215089	5x2x0,50	10,0	53,9	114	215125	5x2x1,0	11,6	98,4	171

Part No.	No. pairs x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. pairs x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
215104	2x2x0,75	8,5	35,8	74	215140	2x2x1,5	10,7	62,8	119
215105	3x2x0,75	8,9	48,2	93	215141	3x2x1,5	11,3	89,7	158
215106	4x2x0,75	10,0	59,5	118	215142	4x2x1,5	12,7	114,9	202
215107	5x2x0,75	10,9	75,5	143	215143	5x2x1,5	13,9	142,3	244



Technical information

- Temperature range
flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Minimum bending radius
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage
up to 1,5mm² 300/500 V
from 2,5mm² 450/750 V
- Test voltage
up to 1,5mm² 1500 V
from 2,5mm² 2500 V
- Conductor resistance @20°C
0,22mm² max. 85,0 Ohm/km
0,50mm² max. 39,0 Ohm/km
0,75mm² max. 26,0 Ohm/km
1,0mm² max. 19,5 Ohm/km
1,5mm² max. 13,3 Ohm/km
2,5mm² max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

Cable according to DIN VDE 0812

Application

These halogen-free flexible cables meet enhanced fire protection requirements, concerning protection of people and high-value property. Do not emit any toxic or corrosive gases in the event of fire and resist the spread of fire. Used for signal transmission in industrial applications. (with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air) Main application ranges are tool making, machine industries, electronic, measurement and control sectors, computer or audio systems or in communication sector.

Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation HF compound; type HI2 acc. to DIN VDE 0207 part 23, type 70°C acc. to EN 50290 2-26
- Colour coded acc. to DIN 47100
- Core stranded in layers with optimal lay-length
- Polyester tape used as separator over cores
- Outer sheath HF compound; type HM2 acc. to DIN VDE 0207 part 24, type 70°C acc. to EN 50290 2-27
- Outer sheath colour, Grey RAL 7001

Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Corrosive gas measurement acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2

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Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
202050	2x0,22	3,5	3,6	16	202122	2x1,0	5,4	16,3	42
202052	3x0,22	3,9	5,4	19	202123	3x1,0	5,7	24,5	49
202053	4x0,22	4,2	7,2	23	202124	4x1,0	6,5	32,7	66
202054	5x0,22	4,5	8,9	28	202125	5x1,0	7,0	40,9	81
202055	6x0,22	4,9	10,8	33	202126	6x1,0	7,7	49,2	98
202056	7x0,22	4,9	12,6	34	202127	7x1,0	7,7	57,4	104
202057	8x0,22	5,7	14,3	45	202128	8x1,0	9,2	65,7	138
202058	10x0,22	6,1	18,0	47	202129	10x1,0	9,9	82,2	150
202059	12x0,22	6,5	21,5	57	202130	12x1,0	10,2	98,5	174

Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
202086	2x0,50	4,7	8,2	29	202140	2x1,5	6,5	24,4	61
202087	3x0,50	4,9	12,3	33	202141	3x1,5	6,9	36,6	72
202088	4x0,50	5,4	16,3	41	202142	4x1,5	7,6	48,9	92
202089	5x0,50	5,9	20,4	51	202143	5x1,5	8,3	61,2	115
202090	6x0,50	6,6	24,5	64	202144	6x1,5	9,2	73,5	143
202091	7x0,50	6,6	28,6	67	202145	7x1,5	9,2	85,8	152
202092	8x0,50	7,7	32,8	87	202146	8x1,5	10,8	98,1	196
202093	10x0,50	8,3	41,1	93	202147	10x1,5	11,9	122,8	219
202094	12x0,50	8,6	49,2	107	202148	12x1,5	12,3	147,3	255

Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
202104	2x0,75	5,1	12,2	35	202158	2x2,5	7,3	40,7	84
202105	3x0,75	5,4	18,4	41	202159	3x2,5	7,7	61,1	102
202106	4x0,75	5,9	24,5	52	202160	4x2,5	8,5	81,4	131
202107	5x0,75	6,6	30,7	68	202161	5x2,5	9,5	101,9	169
202108	6x0,75	7,2	36,8	81	202162	6x2,5	10,4	122,5	203
202109	7x0,75	7,2	43,0	86	202163	7x2,5	10,4	142,9	220
202110	8x0,75	8,4	49,3	111	202164	8x2,5	12,5	163,6	286
202111	10x0,75	9,3	61,6	125	202165	10x2,5	13,5	204,8	317
202112	12x0,75	9,6	73,9	144	202166	12x2,5	14,0	245,8	372



Technical information

- Temperature range
flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Minimum bending radius
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage
up to 1,5mm² 300/500 V
from 2,5mm² 450/750 V
- Test voltage
up to 1,5mm² 1500 V
from 2,5mm² 2500 V
- Conductor resistance @20°C
0,22mm² max. 85,0 Ohm/km
0,50mm² max. 39,0 Ohm/km
0,75mm² max. 26,0 Ohm/km
1,0mm² max. 19,5 Ohm/km
1,5mm² max. 13,3 Ohm/km
2,5mm² max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

Cable according to DIN VDE 0812

Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation HF compound; type HI2 acc. to DIN VDE 0207 part 23, type 70°C acc. to EN 50290 2-26
- Colour coded acc. to DIN 47100
- Core stranded in layers with optimal lay-length
- Polyester tape used as separator over cores
- Overall braiding of tinned copper wires
- Outer sheath HF compound; type HM2 acc. to DIN VDE 0207 part 24, type 70°C acc. to EN 50290 2-27
- Outer sheath colour, Grey RAL 7001

Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Corrosive gas measurement acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2

TSE VDE CE | TSEK UBM-03-BK-022
DIN VDE 0812
Low Voltage Directive 2006/95/EC
RoHS compliant

Application

These halogen-free flexible cables meet enhanced fire protection requirements, concerning protection of people and high-value property. Do not emit any toxic or corrosive gases in the event of fire and resist the spread of fire. Used for signal transmission in industrial applications. (with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air) Main application ranges are tool making, machine industries, electronic, measurement and control sectors, computer or audio systems or in communication sector. The high density of the braiding assures disturbance-free transmission of all signals and impulses. This can be important when trying to ensure electromagnetic compatibility. (EMC)

Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
204051	2x0,22	4,2	8,1	23	204123	2x1,0	5,9	23,4	50
204052	3x0,22	4,4	9,9	25	204124	3x1,0	6,2	31,5	58
204053	4x0,22	4,7	11,8	29	204125	4x1,0	7,0	41,0	76
204054	5x0,22	5,0	14,7	35	204126	5x1,0	7,5	50,6	92
204055	6x0,22	5,4	16,6	40	204127	6x1,0	8,2	60,2	111
204056	7x0,22	5,4	18,4	42	204128	7x1,0	8,2	68,4	117
204057	8x0,22	6,2	22,6	54	204129	8x1,0	9,7	78,4	153
204058	10x0,22	6,8	26,3	60	204130	10x1,0	10,4	95,8	166
204059	12x0,22	7,0	29,9	67	204131	12x1,0	10,7	112,3	190

Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
204086	2x0,50	5,2	14,0	36	204140	2x1,5	7,0	32,7	71
204087	3x0,50	5,4	18,1	40	204141	3x1,5	7,4	46,3	84
204088	4x0,50	5,9	23,4	49	204142	4x1,5	8,1	58,7	103
204089	5x0,50	6,6	28,7	63	204143	5x1,5	8,8	72,5	128
204090	6x0,50	7,1	32,9	74	204144	6x1,5	9,7	86,3	157
204091	7x0,50	7,1	37,0	77	204145	7x1,5	9,7	98,5	167
204092	8x0,50	8,2	43,9	99	204146	8x1,5	11,3	114,1	214
204093	10x0,50	8,8	52,3	106	204147	10x1,5	12,4	139,3	238
204094	12x0,50	9,3	61,8	126	204148	12x1,5	12,8	164,0	274

Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
204104	2x0,75	5,6	19,2	43	204158	2x2,5	7,8	50,4	95
204105	3x0,75	5,9	25,4	50	204159	3x2,5	8,2	72,1	115
204106	4x0,75	6,6	32,8	65	204160	4x2,5	9,2	92,7	148
204107	5x0,75	7,1	39,0	78	204161	5x2,5	10,0	114,8	184
204108	6x0,75	7,7	46,5	93	204162	6x2,5	10,9	136,4	219
204109	7x0,75	7,7	52,7	98	204163	7x2,5	10,9	156,8	236
204110	8x0,75	8,9	60,5	124	204164	8x2,5	13,0	180,4	305
204111	10x0,75	9,8	74,4	139	204165	10x2,5	14,0	224,4	339
204112	12x0,75	10,1	86,8	159	204166	12x2,5	14,5	265,6	394



Technical information

- Temperature range
flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Minimum bending radius
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage
up to 1,5mm² 300/500 V
from 2,5mm² 450/750 V
- Test voltage
up to 1,5mm² 1500 V
from 2,5mm² 2500 V
- Conductor resistance @20°C
0,22mm² max. 85,0 Ohm/km
0,50mm² max. 39,0 Ohm/km
0,75mm² max. 26,0 Ohm/km
1,0mm² max. 19,5 Ohm/km
1,5mm² max. 13,3 Ohm/km
2,5mm² max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

Cable according to DIN VDE 0812

Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation HF compound; type HI2 acc. to DIN VDE 0207 part 23, type 70°C acc. to EN 50290 2-26
- Colour coded acc. to DIN 47100
- Core stranded in layers with optimal lay-length
- Polyester tape used as separator over cores
- Stranded tinned copper drain wire, electrostatic screen (St) of plastic coated aluminium foil
- Outer sheath HF compound; type HM2 acc. to DIN VDE 0207 part 24, type 70°C acc. to EN 50290 2-27
- Outer sheath colour, Grey RAL 7001

Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Corrosive gas measurement acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2

TSE | TSEK UBM-03-BK-022
 VDE | DIN VDE 0812
 CE | Low Voltage Directive 2006/95/EC
 RoHS compliant

Application

These halogen-free flexible cables meet enhanced fire protection requirements, concerning protection of people and high-value property. Do not emit any toxic or corrosive gases in the event of fire and resist the spread of fire. Used for signal transmission in industrial applications. (with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air) Main application ranges are tool making, machine industries, electronic, measurement and control sectors, computer or audio systems or in communication sector. Electrostatic screen and the high density of the braiding assure disturbance-free transmission of all signals and impulses. This can be important when trying to ensure electromagnetic compatibility. (EMC)

Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
206050	2x0,22	4,2	8,1	24	206122	2x1,0	5,9	22,2	49
206051	3x0,22	4,4	9,9	25	206123	3x1,0	6,2	31,6	58
206052	4x0,22	4,7	11,8	29	206124	4x1,0	7,0	39,8	75
206053	5x0,22	5,0	13,6	34	206125	5x1,0	7,5	49,4	92
206054	6x0,22	5,4	16,6	41	206126	6x1,0	8,2	57,8	109
206055	7x0,22	5,4	18,4	42	206127	7x1,0	8,2	66,0	115
206056	8x0,22	6,2	21,4	54	206128	8x1,0	9,7	75,9	151
206057	10x0,22	6,8	25,1	60	206129	10x1,0	10,4	93,9	165
206058	12x0,22	7,0	28,7	67	206130	12x1,0	10,7	110,3	189

Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
206086	2x0,50	5,2	14,0	36	206140	2x1,5	7,0	31,6	70
206087	3x0,50	5,4	18,1	40	206141	3x1,5	7,4	43,9	82
206088	4x0,50	5,9	22,2	49	206142	4x1,5	8,1	57,5	103
206089	5x0,50	6,6	27,6	63	206143	5x1,5	8,8	71,2	127
206090	6x0,50	7,1	31,7	73	206144	6x1,5	9,7	83,7	156
206091	7x0,50	7,1	35,8	76	206145	7x1,5	9,7	96,0	165
206092	8x0,50	8,2	41,5	98	206146	8x1,5	11,3	110,2	210
206093	10x0,50	8,8	51,1	105	206147	10x1,5	12,4	136,6	236
206094	12x0,50	9,3	59,3	124	206148	12x1,5	12,8	161,3	272

Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
206104	2x0,75	5,6	18,1	43	206158	2x2,5	7,8	49,2	95
206105	3x0,75	5,9	24,2	49	206159	3x2,5	8,2	69,7	113
206106	4x0,75	6,6	31,6	64	206160	4x2,5	9,2	91,5	148
206107	5x0,75	7,1	37,8	77	206161	5x2,5	10,0	112,2	182
206108	6x0,75	7,7	45,3	92	206162	6x2,5	10,9	134,4	218
206109	7x0,75	7,7	51,5	97	206163	7x2,5	10,9	154,8	235
206110	8x0,75	8,9	59,3	123	206164	8x2,5	13,0	177,6	303
206111	10x0,75	9,8	71,9	138	206165	10x2,5	14,0	220,0	335
206112	12x0,75	10,1	84,2	157	206166	12x2,5	14,5	261,3	391



Technical information

- Temperature range
flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Minimum bending radius
flexible 1.5x cable Ø, fixed 7.5x cable Ø
- Nominal voltage
up to 1,5mm² 300/500 V
from 2,5mm² 450/750 V
- Test voltage
up to 1,5mm² 1500 V
from 2,5mm² 2500 V
- Conductor resistance @20°C
0,22mm² max. 85,0 Ohm/km
0,50mm² max. 39,0 Ohm/km
0,75mm² max. 26,0 Ohm/km
1,0mm² max. 19,5 Ohm/km
1,5mm² max. 13,3 Ohm/km
2,5mm² max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

Cable according to DIN VDE 0812

Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation HF compound; type HI2 acc. to DIN VDE 0207 part 23, type 70°C acc. to EN 50290 2-26
- Colour coded acc. to DIN 47100
- Core stranded in layers with optimal lay-length
- Electrostatic screen (St) of plastic coated aluminium foil used as separator over cores
- Overall braiding of tinned copper wires
- Outer sheath HF compound; type HM2 acc. to DIN VDE 0207 part 24, type 70°C acc. to EN 50290 2-27
- Outer sheath colour, Grey RAL 7001

Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Corrosive gas measurement acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2

TSE | TSEK UBM-03-BK-022
 VDE | DIN VDE 0812
 CE | Low Voltage Directive 2006/95/EC
 RoHS compliant

Application

These halogen-free flexible cables meet enhanced fire protection requirements, concerning protection of people and high-value property. Do not emit any toxic or corrosive gases in the event of fire and resist the spread of fire. Used for signal transmission in industrial applications. (with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air) Main application ranges are tool making, machine industries, electronic, measurement and control sectors, computer or audio systems or in communication sector. Electrostatic screen and the high density of the braiding assure disturbance-free transmission of all signals and impulses. This can be important when trying to ensure electromagnetic compatibility. (EMC)

Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
208050	2x0,22	4,2	8,1	24	208086	2x0,50	5,2	14,0	36
208051	3x0,22	4,4	9,9	25	208087	3x0,50	5,4	18,1	40
208052	4x0,22	4,7	11,8	29	208088	4x0,50	5,9	22,2	49
208053	5x0,22	5,0	13,6	34	208089	5x0,50	6,6	27,6	63
208054	6x0,22	5,4	16,6	41	208090	6x0,50	7,1	31,7	73
208055	7x0,22	5,4	18,4	42	208091	7x0,50	7,1	35,8	76
208056	8x0,22	6,2	21,4	54	208092	8x0,50	8,2	41,5	98
208057	10x0,22	6,8	25,1	60	208093	10x0,50	8,8	51,1	105
208058	12x0,22	7,0	28,7	67	208094	12x0,50	9,3	59,3	124

Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
208104	2x0,75	5,6	18,1	43	208122	2x1,0	5,9	22,2	49
208105	3x0,75	5,9	24,2	49	208123	3x1,0	6,2	31,6	58
208106	4x0,75	6,6	31,6	64	208124	4x1,0	7,0	39,8	75
208107	5x0,75	7,1	37,8	77	208125	5x1,0	7,5	49,4	92
208108	6x0,75	7,7	45,3	92	208126	6x1,0	8,2	57,8	109
208109	7x0,75	7,7	51,5	97	208127	7x1,0	8,2	66,0	115
208110	8x0,75	8,9	59,3	123	208128	8x1,0	9,7	75,9	151
208111	10x0,75	9,8	71,9	138	208129	10x1,0	10,4	93,9	165
208112	12x0,75	10,1	84,2	157	208130	12x1,0	10,7	110,3	189

Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
208140	2x1,5	7,0	31,6	70	208158	2x2,5	7,8	49,2	95
208141	3x1,5	7,4	43,9	82	208159	3x2,5	8,2	69,7	113
208142	4x1,5	8,1	57,5	103	208160	4x2,5	9,2	91,5	148
208143	5x1,5	8,8	71,2	127	208161	5x2,5	10,0	112,2	182
208144	6x1,5	9,7	83,7	156	208162	6x2,5	10,9	134,4	218
208145	7x1,5	9,7	96,0	165	208163	7x2,5	10,9	154,8	235
208146	8x1,5	11,3	110,2	210	208164	8x2,5	13,0	177,6	303
208147	10x1,5	12,4	136,6	236	208165	10x2,5	14,0	220,0	335
208148	12x1,5	12,8	161,3	272	208166	12x2,5	14,5	261,3	391



Technical information

- Temperature range
flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Minimum bending radius
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage
up to 1,5mm² 300/500 V
from 2,5mm² 450/750 V
- Test voltage
up to 1,5mm² 1500 V
from 2,5mm² 2500 V
- Conductor resistance @20°C
0,22mm² max. 85,0 Ohm/km
0,50mm² max. 39,0 Ohm/km
0,75mm² max. 26,0 Ohm/km
1,0mm² max. 19,5 Ohm/km
1,5mm² max. 13,3 Ohm/km
2,5mm² max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

Cable according to DIN VDE 0812

Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation HF compound; type HI2 acc. to DIN VDE 0207 part 23, type 70°C acc. to EN 50290 2-26
- Core and pair identification acc. to DIN 47100
- Cores twisted in pairs and pairs stranded together in layers with optimal lay-length
- Polyester tape used as separator over cores
- Outer sheath HF compound; type HM2 acc. to DIN VDE 0207 part 24, type 70°C acc. to EN 50290 2-27
- Outer sheath colour, Grey RAL 7001

Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Corrosive gas measurement acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2

TSE	TSEK UBM-03-BK-022
VDE	DIN VDE 0812
CE	Low Voltage Directive 2006/95/EC
	RoHS compliant

Application

These halogen-free flexible cables meet enhanced fire protection requirements, concerning protection of people and high-value property. Do not emit any toxic or corrosive gases in the event of fire and resist the spread of fire. Used for signal transmission in industrial applications. (with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air) Twisted pair structure minimizes crosstalk. Main application ranges are tool making, machine industries, electronic, measurement and control sectors, computer or audio systems or in communication sector.

Part No.	No. pairs x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. pairs x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
441502	2x2x0,50	7,3	16,4	49	441102	2x2x1,0	8,5	32,8	73
441503	3x2x0,50	7,7	24,6	64	441103	3x2x1,0	9,2	49,3	102
441504	4x2x0,50	8,5	32,9	80	441104	4x2x1,0	10,1	65,7	128
441505	5x2x0,50	9,5	41,1	101	441105	5x2x1,0	11,1	82,2	155

Part No.	No. pairs x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. pairs x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
441702	2x2x0,75	8,0	24,6	62	441802	2x2x1,5	10,2	49,1	105
441703	3x2x0,75	8,4	36,9	81	441803	3x2x1,5	10,8	73,6	142
441704	4x2x0,75	9,5	49,2	107	441804	4x2x1,5	12,2	98,2	186
441705	5x2x0,75	10,4	61,6	129	441805	5x2x1,5	13,4	122,8	226



Technical information

- Temperature range
flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Minimum bending radius
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage
up to 1,5mm² 300/500 V
from 2,5mm² 450/750 V
- Test voltage
up to 1,5mm² 1500 V
from 2,5mm² 2500 V
- Conductor resistance @20°C
0,22mm² max. 85,0 Ohm/km
0,50mm² max. 39,0 Ohm/km
0,75mm² max. 26,0 Ohm/km
1,0mm² max. 19,5 Ohm/km
1,5mm² max. 13,3 Ohm/km
2,5mm² max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

Cable according to DIN VDE 0812

Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation HF compound; type HI2 acc. to DIN VDE 0207 part 23, type 70°C acc. to EN 50290 2-26
- Core and pair identification acc. to DIN 47100
- Cores twisted in pairs and pairs stranded together in layers with optimal lay-length
- Polyester tape used as separator over cores
- Overall braiding of tinned copper wires
- Outer sheath HF compound; type HM2 acc. to DIN VDE 0207 part 24, type 70°C acc. to EN 50290 2-27
- Outer sheath colour, Grey RAL 7001

Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Corrosive gas measurement acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2

TSE
VDE
CE

TSEK UBM-03-BK-022
DIN VDE 0812
Low Voltage Directive 2006/95/EC
RoHS compliant

Application

These halogen-free flexible cables meet enhanced fire protection requirements, concerning protection of people and high-value property. Do not emit any toxic or corrosive gases in the event of fire and resist the spread of fire. Used for signal transmission in industrial applications. (with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air) Twisted pair structure minimizes crosstalk. Main application ranges are tool making, machine industries, electronic, measurement and control sectors, computer or audio systems or in communication sector. The high density of the braiding assures disturbance-free transmission of all signals and impulses. This can be important when trying to ensure electromagnetic compatibility (EMC).

Part No.	No. pairs x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. pairs x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
212086	2x2x0,50	7,8	26,1	61	212122	2x2x1,0	9,2	44,1	90
212087	3x2x0,50	8,2	35,7	77	212123	3x2x1,0	9,7	62,0	116
212088	4x2x0,50	9,2	44,2	97	212124	4x2x1,0	10,6	79,4	144
212089	5x2x0,50	10,0	53,9	115	212125	5x2x1,0	11,6	98,4	173

Part No.	No. pairs x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. pairs x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
212104	2x2x0,75	8,5	35,8	74	212140	2x2x1,5	10,7	62,8	121
212105	3x2x0,75	8,9	48,2	94	212141	3x2x1,5	11,3	89,7	160
212106	4x2x0,75	10,0	62,1	122	212142	4x2x1,5	12,7	114,8	205
212107	5x2x0,75	10,9	75,5	145	212143	5x2x1,5	13,9	142,3	248



Technical information

- Temperature range
flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Minimum bending radius
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage
up to 1,5mm² 300/500 V
from 2,5mm² 450/750 V
- Test voltage
up to 1,5mm² 1500 V
from 2,5mm² 2500 V
- Conductor resistance @20°C
0,22mm² max. 85,0 Ohm/km
0,50mm² max. 39,0 Ohm/km
0,75mm² max. 26,0 Ohm/km
1,0mm² max. 19,5 Ohm/km
1,5mm² max. 13,3 Ohm/km
2,5mm² max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

Cable according to DIN VDE 0812

Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation HF compound; type HI2 acc. to DIN VDE 0207 part 23, type 70°C acc. to EN 50290 2-26
- Core and pair identification acc. to DIN 47100
- Cores twisted in pairs and pairs stranded together in layers with optimal lay-length
- Polyester tape used as separator over cores
- Stranded tinned copper drain wire, electrostatic screen (St) of plastic coated aluminium foil
- Outer sheath HF compound; type HM2 acc. to DIN VDE 0207 part 24, type 70°C acc. to EN 50290 2-27
- Outer sheath colour, Grey RAL 7001

Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Corrosive gas measurement acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2

TSE VDE CE | TSEK UBM-03-BK-022
DIN VDE 0812
Low Voltage Directive 2006/95/EC
RoHS compliant

Application

These halogen-free flexible cables meet enhanced fire protection requirements, concerning protection of people and high-value property. Do not emit any toxic or corrosive gases in the event of fire and resist the spread of fire. Used for signal transmission in industrial applications. (with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air) Twisted pair structure minimizes crosstalk. Main application ranges are tool making, machine industries, electronic, measurement and control sectors, computer or audio systems or in communication sector. Electrostatic screen assures disturbance-free transmission of all signals and impulses. This can be important when trying to ensure electromagnetic compatibility (EMC).

Part No.	No. pairs x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. pairs x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
214086	443502	7,5	18,2	53	214122	2x2x1,0	8,7	37,3	79
214087	443503	7,9	26,4	68	214123	3x2x1,0	9,4	53,7	109
214088	443504	8,7	34,6	84	214124	4x2x1,0	10,3	70,2	135
214089	443505	9,7	42,9	105	214125	5x2x1,0	11,3	86,6	163

Part No.	No. pairs x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. pairs x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
214104	2x2x0,75	8,2	29,1	68	214140	2x2x1,5	10,4	53,5	112
214105	3x2x0,75	8,6	41,4	88	214141	3x2x1,5	11,0	78,1	149
214106	4x2x0,75	9,7	53,7	114	214142	4x2x1,5	12,4	102,6	194
214107	5x2x0,75	10,6	66,1	136	214143	5x2x1,5	13,6	127,3	234



Technical information

- Temperature range
flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Minimum bending radius
flexible 15x cable Ø, fixed 7,5x cable Ø
- Nominal voltage
up to 1,5mm² 300/500 V
from 2,5mm² 450/750 V
- Test voltage
up to 1,5mm² 1500 V
from 2,5mm² 2500 V
- Conductor resistance @20°C
0,22mm² max. 85,0 Ohm/km
0,50mm² max. 39,0 Ohm/km
0,75mm² max. 26,0 Ohm/km
1,0mm² max. 19,5 Ohm/km
1,5mm² max. 13,3 Ohm/km
2,5mm² max. 7,98 Ohm/km
- Insulation resistance; min. 200 M.Ohm x km

Cable according to DIN VDE 0812

Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation HF compound; type HI2 acc. to DIN VDE 0207 part 23, type 70°C acc. to EN 50290 2-26
- Core and pair identification acc. to DIN 47100
- Cores twisted in pairs and pairs stranded together in layers with optimal lay-length
- Electrostatic screen (St) of plastic coated aluminium foil used as separator over cores
- Overall braiding of tinned copper wires
- Outer sheath HF compound; type HM2 acc. to DIN VDE 0207 part 24, type 70°C acc. to EN 50290 2-27
- Outer sheath colour, Grey RAL 7001

Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Corrosive gas measurement acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2

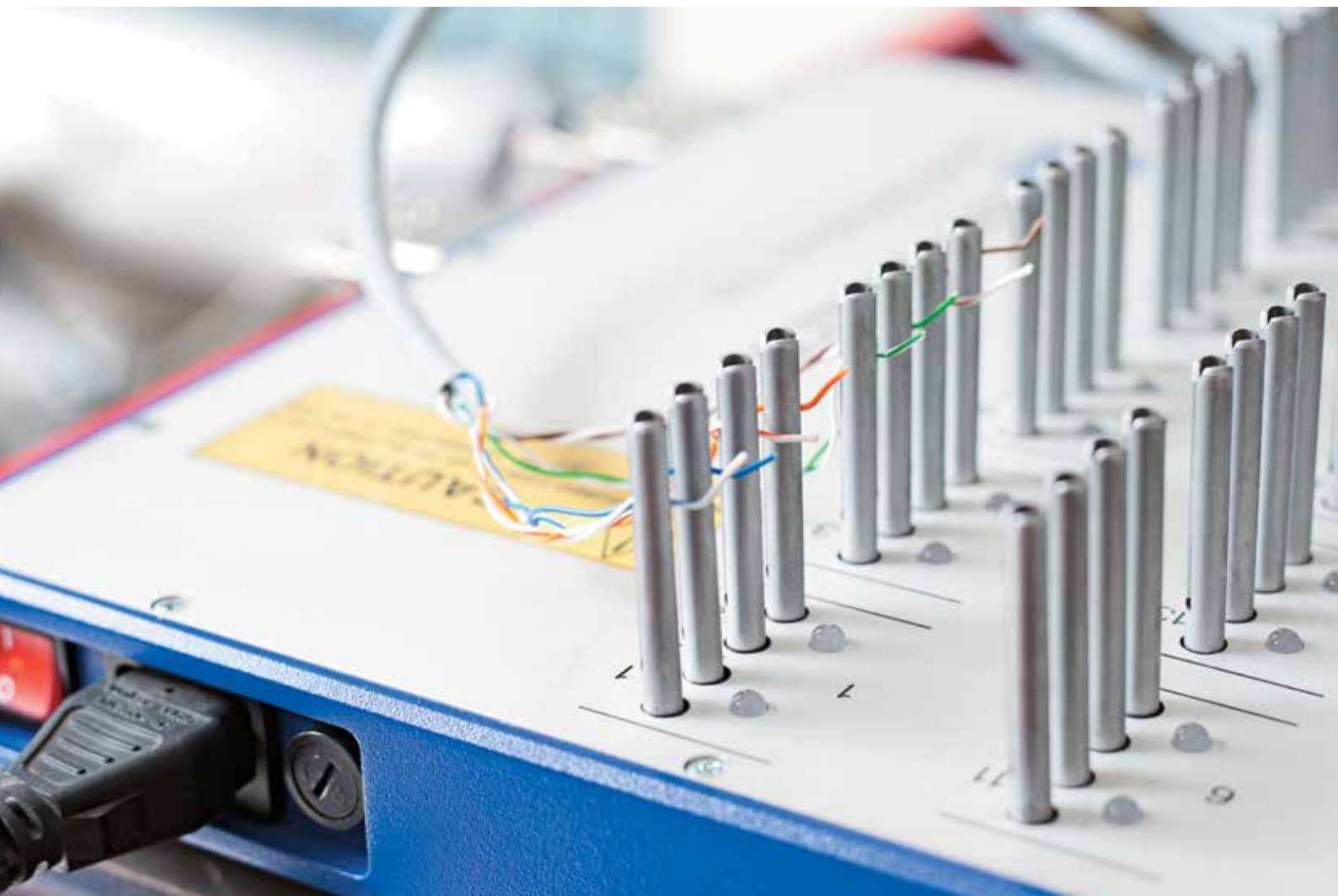
TSE VDE CE | TSEK UBM-03-BK-022
DIN VDE 0812
Low Voltage Directive 2006/95/EC
RoHS compliant

Application

These halogen-free flexible cables meet enhanced fire protection requirements, concerning protection of people and high-value property. Do not emit any toxic or corrosive gases in the event of fire and resist the spread of fire. Used for signal transmission in industrial applications. (with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air) Twisted pair structure minimizes crosstalk. Main application ranges are tool making, machine industries, electronic, measurement and control sectors, computer or audio systems or in communication sector. Electrostatic screen and the high density of the braiding assure disturbance-free transmission of all signals and impulses. This can be important when trying to ensure electromagnetic compatibility. (EMC)

Part No.	No. pairs x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. pairs x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
216086	2x2x0,50	7,8	26,2	61	216122	2x2x1,0	9,2	44,1	91
216087	3x2x0,50	8,2	35,7	77	216123	3x2x1,0	9,7	62,0	117
216088	4x2x0,50	9,2	44,2	98	216124	4x2x1,0	10,6	79,5	145
216089	5x2x0,50	10,0	53,9	116	216125	5x2x1,0	11,6	98,4	174

Part No.	No. pairs x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. pairs x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
216104	2x2x0,75	8,5	35,8	75	216140	2x2x1,5	10,7	62,8	122
216105	3x2x0,75	8,9	48,2	95	216141	3x2x1,5	11,3	89,7	161
216106	4x2x0,75	10,0	59,5	120	216142	4x2x1,5	12,7	114,9	206
216107	5x2x0,75	10,9	75,5	146	216143	5x2x1,5	13,9	142,3	249



VARIOUS

Cables





Technical information

- Temperature range flexible -5°C up to +50°C, fixed -30°C up to +70°C
- Minimum bending radius; 10x cable Ø
- Nominal voltage; 300 V
- Test voltage; 800 V (core/core and core/screen)
- Mutual capacitance; 100nF/km (for the cables up to 4 pair, this value may be increased by 20%)
- Capacitance unbalances; 300pF/100m (20% of the values, but one value up to 500pF is allowed)
- Loop resistance @20°C
0,80mm - max. 73,2 Ohm/km
1,0mm² - max. 36,2 Ohm/km
1,5mm² - max. 24,2 Ohm/km
- Insulation resistance; min. 100 M.Ohm x km

Installation cable according to DIN VDE 0815

TSE	TSEK UBM-03-BK-023
VDE	DIN VDE 0815
CE	Low Voltage Directive 2006/95/EC
	RoHS compliant

Cable construction

- Annealed solid copper conductor; Ø 0,80, 1,12 and 1,37mm
- Core insulation PVC compound; type Y11 acc. to DIN VDE 0207 part 4, type T151 acc. to EN 50290 2-21
- Core and pair identification acc. to DIN VDE 0815
- Cores twisted in pairs and pairs stranded together in layers with optimal lay-length (2-paired versions are stranded in star quad cable design)
- Polyester tape used as separator over cores
- Tinned copper drain wire Ø 0,80mm, electrostatic screen (St) of plastic coated aluminium foil
- Outer sheath, flame resistant PVC compound; type YM1 acc. to DIN VDE 0207 part 5, type TM51 acc. to EN 50290 2-22
- Outer sheath colour, Red RAL 3000

Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2

Application

These cables are used especially for installation in fire alarm systems. Thanks to electrostatic screen and tin-plated drain wire, external electrical interferences of high frequency and electromagnetic field are minimized. Twisted pair structure minimizes crosstalk. For fixed installation on and under plaster, in dry and damp rooms. For outdoor use this cable should be installed under plaster only.

Part No.	No. pairs x diameter [mm]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. pairs x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
109097	1x2x0,80	5,5	10,2	37	109173	1x2x1,0	6,3	22,2	55
109098	2x2x0,80	6,1	19,3	52	109174	2x2x1,0	7,1	40,0	82
109099	3x2x0,80	8,1	28,4	76	109175	1x2x1,5	7,1	30,6	70
109100	4x2x0,80	8,8	37,5	93	109176	2x2x1,5	8,1	56,9	109



Technical information

- Temperature range flexible -5°C up to +50°C, fixed -30°C up to +70°C
- Minimum bending radius; 10x cable Ø
- Nominal voltage; 300 V
- Test voltage; 800 V (core/core and core/screen)
- Mutual capacitance; 100nF/km (for the cables up to 4 pair, this value may be increased by 20%)
- Capacitance unbalances; 300pF/100m (20% of the values, but one value up to 500pF is allowed)
- Loop resistance @20°C
0,80mm - max. 73,2 Ohm/km
1,0mm² - max. 36,2 Ohm/km
1,5mm² - max. 24,2 Ohm/km
- Insulation resistance; min. 100 M.Ohm x km

Installation cable according to DIN VDE 0815

TSE VDE CE | TSEK UBM-03-BK-023
DIN VDE 0815
Low Voltage Directive 2006/95/EC
RoHS compliant

Cable construction

- Annealed solid copper conductor; Ø 0,80, 1,12 and 1,37mm
- Core insulation HF compound; type HI2 acc. to DIN VDE 0207 part 23, type 70°C acc. to EN 50290 2-26
- Core and pair identification acc. to DIN VDE 0815
- Cores twisted in pairs and pairs stranded together in layers with optimal lay-length (2-paired versions are stranded in star quad cable design)
- Polyester tape used as separator over cores
- Tinned copper drain wire Ø 0,80mm, electrostatic screen (St) of plastic coated aluminium foil
- Outer sheath HF compound; type HM2 acc. to DIN VDE 0207 part 24, type 70°C acc. to EN 50290 2-27
- Outer sheath colour, Red RAL 3000

Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Corrosive gas measurement acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2

Application

These halogen-free installation cables meet enhanced fire protection requirements, concerning protection of people and high-value property. Do not emit any toxic or corrosive gases in the event of fire and resist the spread of fire. Used especially for installation in fire alarm systems. Thanks to electrostatic screen and tin-plated drain wire, external electrical interferences of high frequency and electromagnetic field are minimized. Twisted pair structure minimizes crosstalk. For fixed installation on and under plaster, in dry and damp rooms. For outdoor use this cable should be installed under plaster only.

Part No.	No. pairs x diameter [mm]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]	Part No.	No. cores x cross-sec. [mm ²]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
110097	1x2x0,80	5,5	13,5	41	110135	1x2x1,0	6,3	22,2	56
110098	2x2x0,80	6,1	22,6	57	110136	2x2x1,0	7,1	40,0	84
110099	3x2x0,80	8,1	31,8	81	110192	1x2x1,5	7,1	30,6	71
110100	4x2x0,80	8,8	40,9	98	110193	2x2x1,5	8,1	56,9	112



Technical information

- Temperature range flexible 0°C up to +50°C, fixed -20°C up to +60°C
- Minimum bending radius; 8x cable Ø
- Operating voltage; max. 125 V
- Test voltage; 1,0 kV DC for 1 minute
- Conductor resistance @20°C; max. 97,8 Ohm/km
- Conductor resistance unbalance @20°C; max. 5%
- Mutual capacitance; max. 56 nF/km
- Capacitance unbalance; max. 400pF/500m
- Insulation resistance; min. 5 G.Ohm x km

Cable according to ANSI/TIA 568-C.2

TSE
CE

TSE K 116
Low Voltage Directive 2006/95/EC
RoHS compliant

PDV: annealed copper, PVC sheath
PDV-K: tinned copper, PVC sheath
PDH: annealed copper, LSZH sheath
PDH-K: tinned copper, LSZH sheath

Application

These indoor telephone cables are used in subscriber and switchboard system.

PDV

Part No.	No. pairs x diameter [mm]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
401018	1x2x0,50+0,50	2,8	5	12
401019	2x2x0,50+0,50	3,9	9	18
401020	3x2x0,50+0,50	4,1	12	23
401021	4x2x0,50+0,50	4,7	16	30
401022	5x2x0,50+0,50	5,1	19	36
401023	6x2x0,50+0,50	5,7	23	44
401025	10x2x0,50+0,50	6,7	37	64
401027	20x2x0,50+0,50	9,2	72	126
401029	30x2x0,50+0,50	11,0	107	183
401031	50x2x0,50+0,50	13,6	178	284
401032	100x2x0,50+0,50	18,7	359	546

PDH

Part No.	No. pairs x diameter [mm]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
403018	1x2x0,50+0,50	2,8	5	12
403019	2x2x0,50+0,50	3,9	9	18
403020	3x2x0,50+0,50	4,1	12	23
403021	4x2x0,50+0,50	4,7	16	30
403022	5x2x0,50+0,50	5,1	19	36
403023	6x2x0,50+0,50	5,7	23	44
403025	10x2x0,50+0,50	6,7	37	64
403027	20x2x0,50+0,50	9,2	72	126
403020	30x2x0,50+0,50	11,0	107	183
403031	50x2x0,50+0,50	13,6	178	284
403032	100x2x0,50+0,50	18,7	359	546

Cable construction

- Annealed or tinned solid copper conductor; Ø0,50mm
- Core insulation solid HDPE; acc. to EN 50290 2-23, type 2Y11 acc to DIN VDE 0207
- Core and pair identification acc. to IEC 189 and IEC 708
- Cores twisted as pairs (or stranded as quad), pairs stranded to unit, several units stranded to layers
- Units identified by coloured identification PP tapes
- Insulated drain wire (transparent jacket) with solid copper
- Cores wrapped with polyester tape
- Outer sheath, flame resistant PVC or LSZH compound;

PVC sheath: Grey RAL 7035, type YM1 acc. to DIN VDE 0207 part 5, type TM51 acc. to EN 50290 2-22

LSZH sheath: Yellow RAL 1021, Orange RAL 2003, Blue RAL 5015, type HM2 acc. to DIN VDE 0207 part 24, type 70°C acc. to EN 50290 2-27

Features

- Vertical flame propagation for PVC and LSZH acc. to DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Corrosive gas measurement only for LSZH acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density only for LSZH acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2

PDV-K

Part No.	No. pairs x diameter [mm]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
402018	1x2x0,50+0,50	2,8	5	12
402019	2x2x0,50+0,50	3,9	9	18
402020	3x2x0,50+0,50	4,1	12	23
402021	4x2x0,50+0,50	4,7	16	30
402022	5x2x0,50+0,50	5,1	19	36
402023	6x2x0,50+0,50	5,7	23	44
402025	10x2x0,50+0,50	6,7	37	64
402027	20x2x0,50+0,50	9,2	72	126
402029	30x2x0,50+0,50	11,0	107	183
402031	50x2x0,50+0,50	13,6	178	284
402032	100x2x0,50+0,50	18,7	359	546

PDH-K

Part No.	No. pairs x diameter [mm]	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
404018	1x2x0,50+0,50	2,8	5	12
404019	2x2x0,50+0,50	3,9	9	18
404020	3x2x0,50+0,50	4,1	12	23
404021	4x2x0,50+0,50	4,7	16	30
404022	5x2x0,50+0,50	5,1	19	36
404023	6x2x0,50+0,50	5,7	23	44
404025	10x2x0,50+0,50	6,7	37	64
404027	20x2x0,50+0,50	9,2	72	126
404029	30x2x0,50+0,50	11,0	107	183
404031	50x2x0,50+0,50	13,6	178	284
404032	100x2x0,50+0,50	18,7	359	546

RG 59 MiniCoax + 2x0,50+2x0,22mm²

CCTV Cable



Technical information

- Temperature range; -30°C+70°C
- Minimum bending radius; 10x cable Ø
- Maximum nominal voltage; 1,1 kV
- Test voltage; 2,5 kV
- Characteristic impedance; 75±3 Ohm
- Capacitance; nom. 55±2 pF/m
- Velocity of propagation; %80
- Attenuation @20°C

1MHz	2,2 dB/100m
5MHz	3,2 dB/100m
10MHz	4,8 dB/100m
100MHz	15 dB/100m
- Conductor resistance @20°C

coaxial, max. 85,0 Ohm/km
power cores, 0,50mm ² max. 39,0 Ohm/km
control cores, 0,22mm ² max. 85,0 Ohm/km
- Insulation resistance

coaxial, min. 2000 M.Ohm x km
power and control cores, min. 200 M.Ohm x km

Features

- Vertical flame propagation for PVC and LSZH acc. to DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Corrosive gas measurement only for LSZH acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density only for LSZH acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2

CE Low Voltage Directive 2006/95/EC
RoHS compliant

Cable construction

Coaxial, 0,22mm²

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation, physical foam PE; EN 50290 2-23
- Electrostatic screen of plastic coated aluminium foil
- Overall braiding of aluminum wires

Power cores, 0,50mm²

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation PVC or LSZH compound
- Colour coded; red, black

Control cores, 0,22mm²

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Core insulation PVC or LSZH compound
- Colour coded; yellow, blue

Cable

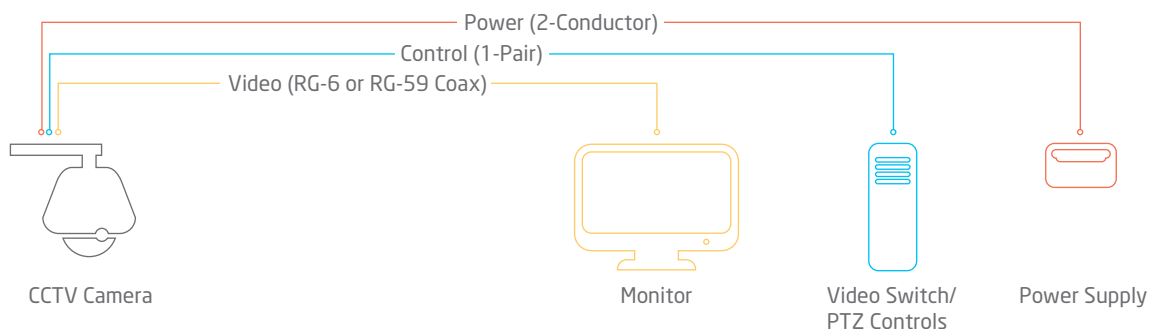
- Cores stranded in layers with optimal lay-length
- Electrostatic screen of plastic coated aluminium foil
- Outer sheath, flame resistant PVC or LSZH compound;

PVC core: type YI2 acc. to DIN VDE 0207 part 4, type TI52 acc. to EN 50290 2-21

LSZH core: type HI2 acc. to DIN VDE 0207 part 23, type 70°C acc. to EN 50290 2-26

PVC sheath: Grey RAL 7001, type YM1 acc. to DIN VDE 0207 part 5, type TM51 acc. to EN 50290 2-22

LSZH sheath: Grey RAL 7001, type HM2 acc. to DIN VDE 0207 part 24, type 70°C acc. to EN 50290 2-27



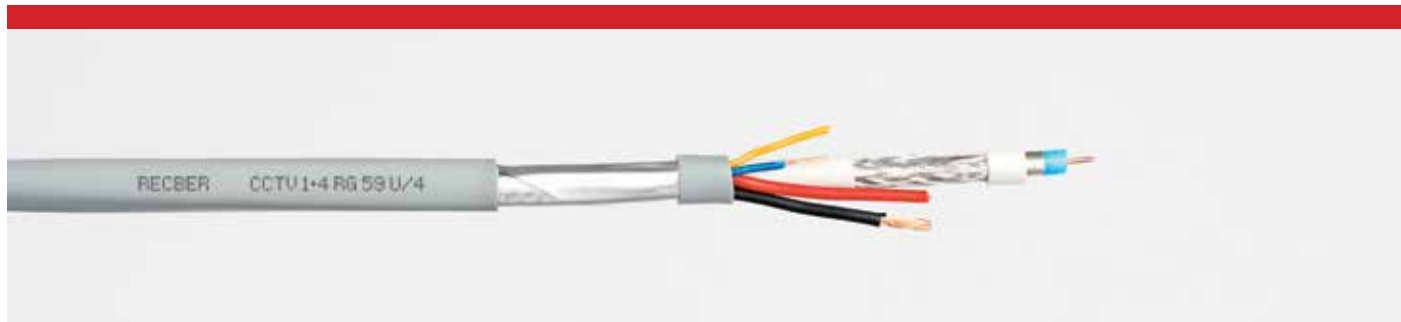
Application

These composite CCTV/Surveillance cables are used in closed circuit camera applications (for pan/tilt/zoom - PTZ cameras) to transmit video, audio and power signals simultaneously. Thanks to composite construction, these cables let users save from installation time significantly.

Part No.	Product Name	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
306051	CCTV 1+2 RG 59 MiniCoax + 2x0,22mm ²	5,7	6	27
306052	CCTV 1+2 RG 59 MiniCoax + 2x0,50mm ²	6,2	10	36
306053	CCTV 1+4 RG 59 MiniCoax + 4x0,22mm ²	6,2	9	36
306054	CCTV 1+4 RG 59 MiniCoax + 2x0,50+2x0,22mm ²	6,2	14	42
306055	CCTV 1+12 RG 59 MiniCoax + 12x0,22mm ²	7,6	23	71
306081	CCTV 1+4 RG 59 MiniCoax + 2x0,50+2x0,22mm ² - LSZH	6,2	14	43

RG 59 U/4 + 2x0,50+2x0,22mm²

CCTV Cable



Technical information

- Temperature range; -30°C+70°C
- Minimum bending radius; 10x cable Ø
- Maximum nominal voltage; 1,1 kV
- Test voltage; 2,5 kV
- Characteristic impedance; 75±3 Ohm
- Capacitance; nom. 55±2 pF/m
- Velocity of propagation; %80
- Attenuation @20°C
 - 1MHz 1,0 dB/100m
 - 5MHz 2,3 dB/100m
 - 10MHz 3,3 dB/100m
 - 100MHz 9,8 dB/100m
- Conductor resistance @20°C
 - coaxial, max. 34,5 Ohm/km
 - power cores, 0,75mm² max. 26,0 Ohm/km
 - control cores, 0,22mm² max. 85,0 Ohm/km
- Insulation resistance
 - coaxial, min. 2000 M.Ohm x km
 - power and control cores, min. 200 M.Ohm x km

Features

- Vertical flame propagation for PVC and LSZH acc. to DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2
- Corrosive gas measurement only for LSZH acc. to DIN VDE 0482-267-2-2, EN 50267-2-2, IEC 60754
- Smoke density only for LSZH acc. to DIN VDE 0482-1034-2, EN 61034-2, IEC 61034-2

CE

Low Voltage Directive 2006/95/EC
RoHS compliant

Application

These composite CCTV/Surveillance cables are used in closed circuit camera applications (for pan/tilt/zoom - PTZ cameras) to transmit video, audio and power signals simultaneously. Thanks to composite construction, these cables let users save from installation time significantly.

Part No.	Product Name	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
306056	CCTV 1+2 RG 59 U/4 + 2x0,50mm ²	8,6	13	64
306057	CCTV 1+4 RG 59 U/4 + 2x0,50+2x0,22mm ²	8,6	16	70
306058	CCTV 1+4 RG 59 U/4 + 2x0,75+2x0,22mm ²	9,2	20	80
306083	CCTV 1+2 RG 59 U/4 + 2x0,75+2x0,22mm ² - LSZH	9,2	20	82

Cable construction

Coaxial, RG 59

- Annealed solid copper conductor; Ø0,81mm (AWG 20)
- Core insulation, physical foam PE; EN 50290 2-23
- Electrostatic screen of plastic coated aluminium foil
- Overall braiding of aluminum wires
- Inner sheath, flame resistant PVC or LSZH compound;
- Power cores, 0,75mm²**
 - Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
 - Core insulation PVC or LSZH compound
 - Colour coded; red, black
- Control cores, 0,22mm²**
 - Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
 - Core insulation PVC or LSZH compound
 - Colour coded; yellow, blue

Cable

- Cores stranded in layers with optimal lay-length
- Electrostatic screen of plastic coated aluminium foil
- Outer sheath, flame resistant PVC, LSZH or PE compound;

PVC core: type YI2 acc. to DIN VDE 0207 part 4, type TI52 acc. to EN 50290 2-21

LSZH core: type HI2 acc. to DIN VDE 0207 part 23, type 70°C acc. to EN 50290 2-26

PVC sheath: Grey RAL 7001, type YM1 acc. to DIN VDE 0207 part 5, type TM51 acc. to EN 50290 2-22

LSZH sheath: Grey RAL 7001, type HM2 acc. to DIN VDE 0207 part 24, type 70°C acc. to EN 50290 2-27

PE sheath: Black, type LDPE acc. to EN 50290 2-24



Technical information

- Temperature range; -30°C+70°C
- Minimum bending radius; 10x cable Ø
- Maximum nominal voltage; 1,1 kV
- Test voltage; 2,5 kV
- Characteristic impedance; 75±3 Ohm
- Capacitance; nom. 67±2 pF/m
- Velocity of propagation; %66
- Attenuation @20°C

1MHz	1,2 dB/100m
5MHz	2,5 dB/100m
10MHz	3,5 dB/100m
100MHz	11 dB/100m
- Conductor resistance @20°C

coaxial, max. 68 Ohm/km
power cores, 0,50mm ² max. 39,0 Ohm/km
power cores, 0,75mm ² max. 26,0 Ohm/km
power cores, 1,0mm ² max. 19,5 Ohm/km
- Insulation resistance

coaxial, min. 2000 M.Ohm x km
power cores, min. 200 M.Ohm x km

Features

- Vertical flame propagation for PVC acc. to DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2

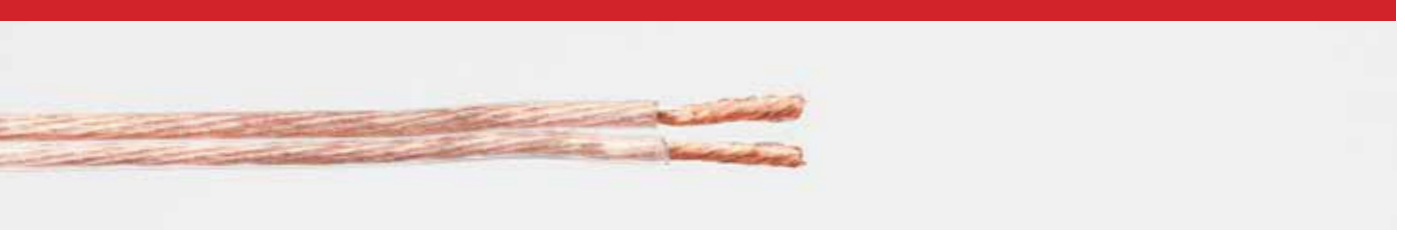
CE | Low Voltage Directive 2006/95/EC
RoHS compliant

Application

These composite CCTV/Surveillance cables are used in closed circuit camera applications (for pan/tilt/zoom - PTZ cameras) to transmit video, audio and power signals simultaneously. Thanks to composite construction, these cables let users save from installation time significantly.

Part No.	Product Name	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
306149	CCTV 1+2 RG 59 B/U + 2x0,50mm ²	9,5	20	89
306150	CCTV 1+2 RG 59 B/U + 2x0,75mm ²	9,8	24	96
306151	CCTV 1+2 RG 59 B/U + 2x1,0mm ²	10,0	28	102
306152	CCTV 1+2 RG 59 B/U + 2x0,50mm ² - Dual	5,8x11,6	20	77
306153	CCTV 1+2 RG 59 B/U + 2x0,75mm ² - Dual	5,8x11,6	24	77
306154	CCTV 1+2 RG 59 B/U + 2x1,0mm ² - Dual	5,8x11,6	28	79

H03VH-H



Technical information

- Temperature range
flexible -5°C up to +70°C, fixed -30°C up to +70°C
- Nominal voltage; 300/300 V
- Conductor resistance @20°C
0,50mm² max. 39,0 Ohm/km
0,75mm² max. 26,0 Ohm/km
1,0mm² max. 19,5 Ohm/km
1,5mm² max. 13,3 Ohm/km
2,5mm² max. 7,98 Ohm/km
- Insulation resistance @70°C
0,50mm² min. 0,016 M.Ohm x km
0,75mm² min. 0,014 M.Ohm x km
1,0mm² min. 0,012 M.Ohm x km
1,5mm² min. 0,010 M.Ohm x km
2,5mm² min. 0,009 M.Ohm x km

Cable construction

- Stranded electrolytic annealed copper; Class 5 acc. to DIN VDE 0295, IEC 60228, HD 383
- Insulation PVC compound; type YI2 acc. to DIN VDE 0207 part 4, type TI52 acc. to EN 50290 2-21
- Insulation colour, white, black and transparent

Features

- Vertical flame propagation acc. to, DIN VDE 0482-332-1-2, EN 60332 1-2, IEC 60332 1-2

CE Low Voltage Directive 2006/95/EC
RoHS compliant

Application

Flexible cable for dry areas, used for connection of small mobile devices, requiring special flexibility in conditions free of any mechanical stresses. Permitted frequent bending, but no twisting. Commonly used as speaker cables (transparent jacketed) and also suitable for radios, desk lamps, electric razors and similar household or office devices, as long as the cable is adapted to essential specifications of the device. Not suitable for cookers and hot devices. Cable ends must be provided with inseparable plugs additionally protected by rubber or thermoplastic insertion.

Part No.	Product Name	Outer Ø app. [mm]	Cu weight [kg/km]	Cable weight [kg/km]
901062	2x0,50mm ² -white	2,3x5,2	8	19
901064	2x0,50mm ² -black	2,3x5,2	8	19
901065	2x0,50mm ² -transparent	2,3x5,2	8	19
901066	2x0,75mm ² -white	2,6x5,6	12	26
901068	2x0,75mm ² -black	2,6x5,6	12	26
901069	2x0,75mm ² -transparent	2,6x5,6	12	26
901073	2x1,0mm ² -transparent	2,8x6,1	16	30
901077	2x1,5mm ² -transparent	3,2x6,9	24	41
901078	2x2,5mm ² -transparent	3,8x8,2	40	63

TECHNICAL INFORMATION

REACH

DIN



RoHS



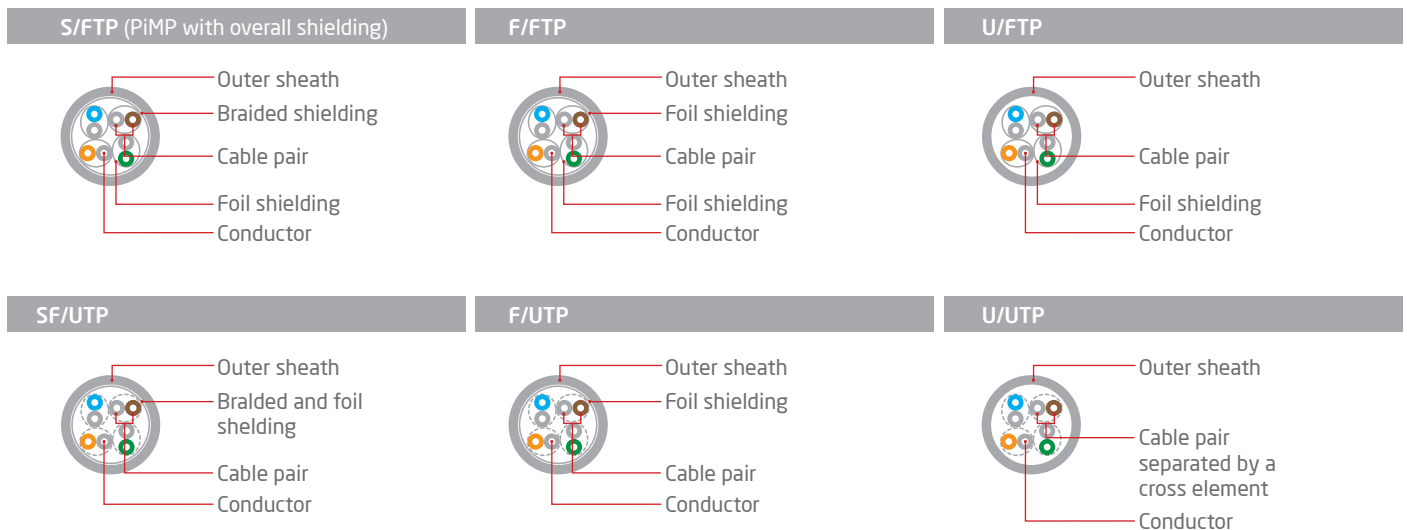
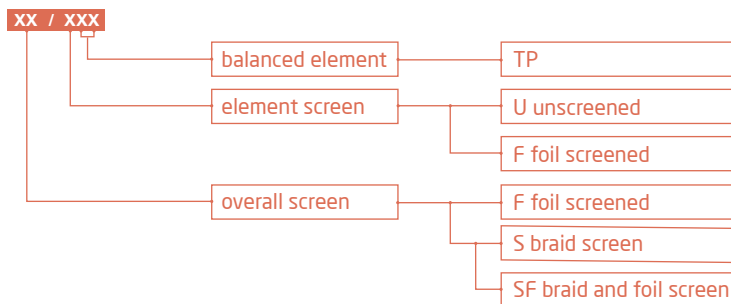
Technical information

Cable type

Based on Amendment 1 and 2 to ISO/IEC 11801, 2nd Ed. following classes for balanced cabling are specified:

Category	Class	Bandwidth	Application
Cat 5 _e	Class D	100 MHz	100 MbE 100 Mbit/s (Fast Ethernet) IEEE 802.3 u
Cat 6	Class E	250 MHz	1 GbE 1,000 Mbit/s (Gigabit Ethernet) IEEE 802.3 ab
Cat 6 _A	Class E _A	500 MHz	Up to 10 GbE 10,000 Mbit/s (10 Gigabit Ethernet) IEEE 802.3 an
Cat 7 _A	Class F _A	600 MHz	10 GbE 10,000 Mbit/s (10 Gigabit Ethernet) IEEE 802.3 an
Cat 7 _A	Class F _A	1000 MHz	10 GbE TV 10,000 Mbit/s (10 Gigabit Ethernet) and TV

This standard also defines cable construction types as follows:



Cable naming

TP (twisted pair) design

S/FTP	Overall shielding (copper braiding)/individual shield (foil)
F/FTP	Overall shielding (foil)/individual shielding (foil)
U/FTP	Unshielded/individual shielding (foil)
SF/UTP	Overall shielding (copper braiding & foil)/unshielded
F/UTP	Overall shielding (foil)/unshielded
U/UTP	Unshielded/unshielded

Pair designation	Color code	Abbreviation
Pair 1	White-Blue Blue	(W-BL) (BL)
Pair 2	White-Orange Orange	(W-O) (O)
Pair 3	White-Green Green	(W-G) (G)
Pair 4	White-Brown Brown	(W-BR) (BR)

Technical terms

IL (Insertion loss): The signal loss resulting from the insertion of a component, or link, or channel, between a transmitter and receiver (often referred to as attenuation).

NEXT (Near-End crosstalk): An interfering signal, induced by the field produced by a transmitted signal in one twisted pair on to a neighbouring twisted pair. The crosstalk is length-independent and becomes bigger with an increasing frequency. The 568C.2 standard specifies the minimum crosstalk value at various frequencies

FEXT (Far-End crosstalk): An interfering signal, referring to crosstalk that is measured at the opposite end of the cable from which it is being disturbed. The crosstalk is length-independent and becomes bigger with an increasing frequency.

PSNEXT (Power Sum Near-End Crosstalk loss): A computation of the unwanted signal coupling from multiple transmitters at the near-end into a pair measured at the near-end.

ACR (Attenuation to Crosstalk Ratio): A normalization of the NEXT measurement results. It is derived by subtracting the insertion loss of the disturbing pair from the NEXT, that this pair induces in an adjacent pair.

ACR-F (Attenuation to Crosstalk Ratio-Far): A normalization of the FEXT measurement results. It is derived by subtracting the insertion loss of the disturbing pair from the FEXT, that this pair induces in an adjacent pair. Also known as ELFEXT.

PSACR-F (Power Sum Attenuation to Crosstalk Ratio-Far): A computation, taking into account the combined crosstalk (statistical) on a receive pair from all far-end disturbers operating simultaneously. Also known as PSELFEXT.

Propagation Delay: The time due to the transmission medium between when a signal is transmitted and when it is received.

Delay Skew : The difference in propagation delay between the fastest and slowest set of wire pairs. An ideal skew is between 25 and 50 nanoseconds over a 100 meter cable. The lower this skew the better, less than 25 ns is excellent, but 45 to 50 ns is marginal.

Velocity of Propagation: The transmission speed of electrical energy in a length of cable compared to speed in free space. Usually expressed as a percentage.

Return Loss: A ratio expressed in dB of the power of the outgoing signal to the power of the reflected signal.

Characteristic Impedance: In a transmission line of infinite length, the ratio of the applied voltage to the resultant current at the point the voltage is applied. Or the impedance which makes a transmission cable seem infinitely long, when connected across the cable's output terminals.

DC Resistance: The property of a conductor, wire or shield that determines the current flow for a given applied voltage. DC resistance shall be measured in accordance with ASTM D4566 for all horizontal cable pairs. For all categories of horizontal cable, the resistance of any conductor shall not exceed 9,38 Ω per 100 m (328 ft) at or corrected to a temperature of 20 °C.

Mutual Capacitance: This is the function of the line geometry and the dielectric constant of the insulation. As long as the dielectric constant of the insulation is constant with frequency, the mutual capacitance is almost frequency-independent. The mutual capacitance increases linearly with the cable length.

Coupling Attenuation: This is the sum of the unsymmetrical attenuation of cable pairs and the shielding effectiveness/attenuation.

Transfer Impedance: The Transfer Impedance is a main parameter for the quality of the screen and is frequency dependent.

The relation is between the voltage drop along the screen on the disturbed lengthways side (outer) to the interfering current on the other side (inside) of the screen. The transfer resistance is determined by the construction of the screen, the skin effect and the capacitive coupling.

Crosstalk: The transmitted signal on one circuit or cable pair causes interference in another circuit or cable pair.

Technical information

TESTS RELATED TO FLAMMABILITY AND FIRE PROPAGATION

Vertical flame propagation IEC 60332-1-2 / EN 60332-1-2 / DIN VDE 0482-332-1-2

Test procedure: 60 cm long single insulated wire or cable is fixed vertically and flamed with a propane gas burner at an angle of 45° to the vertical.

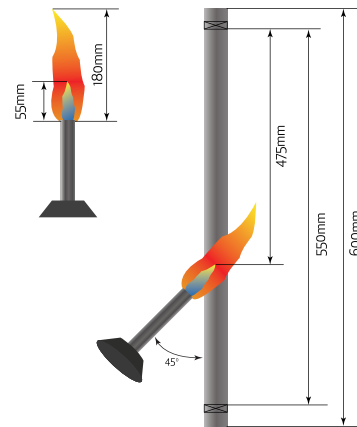
Test apparatus is acc. to IEC / EN 60332-1-1

Burner/supply arrangement: Determined acc. to IEC 60695-11-2

Test duration:

Cable diameter	Duration
$D \leq 25 \text{ mm}$	$60 \pm 2 \text{ sec}$
$25 < D \leq 50 \text{ mm}$	$120 \pm 2 \text{ sec}$
$50 < D < 75 \text{ mm}$	$240 \pm 2 \text{ sec}$
$D > 75 \text{ mm}$	$480 \pm 2 \text{ sec}$

Compliance condition: The fire damage must end at least 50 mm below the upper fixing clamp. The cable must be self-extinguishing. In case the flame reaches to the point which is > 540 mm away from below part of upper fixing clamp, then a fault is recorded and two more trials should be performed. Providing that both trials meet the condition, the cable is evaluated as to pass the test.



Vertical flame spread IEC 60332-3 / EN 60332-3 / DIN VDE 0482-332-3

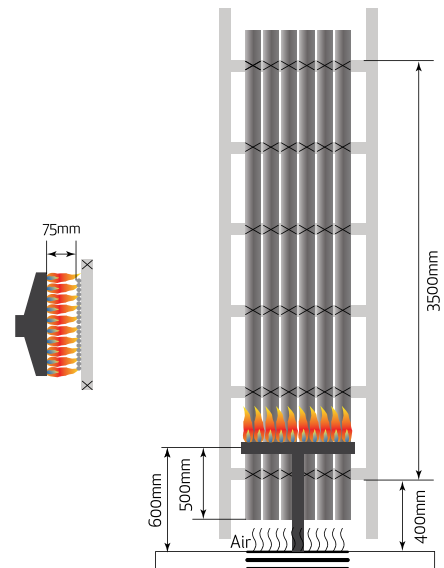
Test procedure: Test cables of 360 cm in length are fixed parallel to a test-ladder as one or more layers, distances between cables are determined based on conductor cross-section of tested cables. The flame is applied to the cable bundles.

Test apparatus and burner/supply arrangement acc. to IEC / EN 60332-3-10

Test duration:

Part number	Category	Duration
Part 21	CAT A F/R for special applications only	-
Part 22	CAT A (7L flammable material/m)	40 min
Part 23	CAT B (3,5L flammable material/m)	40 min
Part 24	CAT C (1,5L flammable material/m)	20 min
Part 25	CAT D (0,5L flammable material/m)	20 min

Compliance condition: After the application of flame acc. to above table, flame must be self-extinguishing and fire damage to the cables must not exceed 2,5 m in height from the bottom edge of the burner.



Circuit integrity (Fire alone) IEC 60331-21 / DIN VDE 0472-814 / IEC 60331-22 (draft) / IEC 60331-23

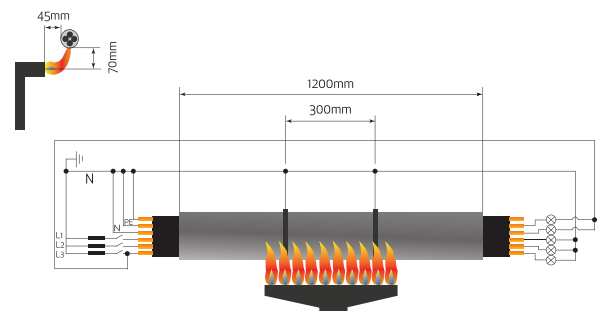
Test procedure: Test cable of approximately 1200 mm in length is fixed in a horizontal position, with the core and shield connected to a power supply at the specific voltages. The flame with a temperature of min. 750 °C, is applied under the cable from a horizontally offset position. Related standard has different parts for specific cable types as follows:

Test duration:

Part number	Related cables
Part 21	power and control cables $\leq 1 \text{ kV}$
Part 22 (draft)	power cables $> 1 \text{ kV}$
Part 23	electric data cables

Test apparatus and burner/supply arrangement acc. to IEC 60331-11
Test duration: 180 min (FE180)

Compliance condition: After the flame is applied and during a cooling period of an additional 15 minutes, single cable should maintain circuit integrity and it must still be possible to transmit power or signals via all conductors. There must be no short circuit between the conductors or to the shielding and no open phase.



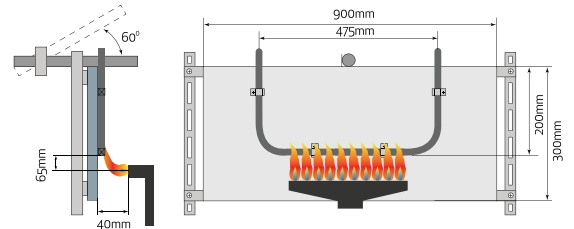
Circuit integrity (Fire and mechanical shock) EN 50200 / DIN VDE 0482-200

Test procedure: Test cable having a max. diameter of 20mm and min. 1200 mm in length is fixed onto a positioning board, with the core and shield connected to a power supply at the specific voltages. The positioning board is subjected to shocks every 5 minutes during the test. The flame with a temperature of min. 842 °C, is applied from the front.

Test apparatus and burner/supply arrangement acc. to EN 50200

Test duration: 120 min (PH120)

Compliance condition: After the flame is applied, single cable should maintain circuit integrity and it must still be possible to transmit power or signals via all conductors. There must be no short circuit between the conductors or to the shielding and no open phase.



Smoke density IEC 61034-2 / EN 61034-2 / DIN VDE 0482-1034-2

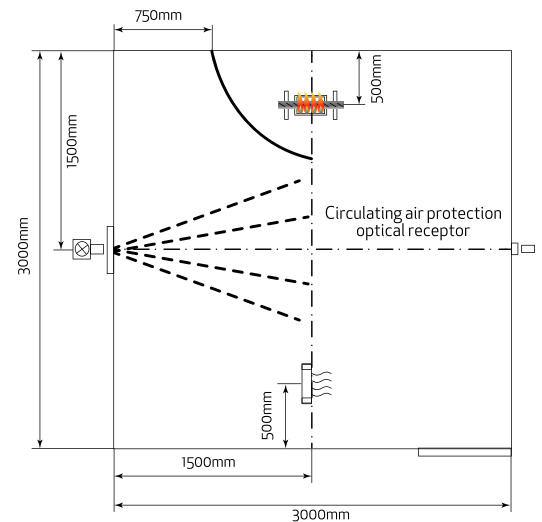
Test procedure: Single cable bundle is burnt in a 3 meter cube metal cabinet by 1L ± 0,01 of alcohol mixture, contained in a metal tray. A photometric system, based on a light source and a photocell, is placed horizontally in the mid vertical plane of the cube, at height of 2150mm ± 100mm. The light transmittance in the resulting smoke is measured optically.

Cable diameter (D) mm	Number of single cables in bundle	Number of bundle
D > 40	1	1
20 < D ≤ 40	2	1
10 < D ≤ 20	3	1
5 ≤ D ≤ 10	45/D	1
1 < D < 5	7	45/3D

Test apparatus and burner/supply arrangement acc. to IEC/EN 61034-1

Test duration: 40 min

Compliance condition: The test is regarded as passed when the photometrically measured light absorption appears within 40 minutes and minimum 60% light transmission is obtained.



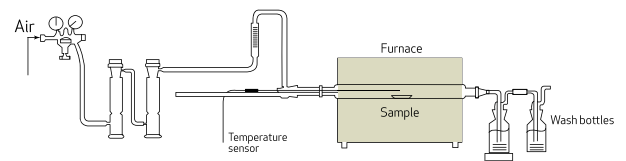
Determination of the amount of halogen acid gas IEC 60754-1 / EN 50267-2-1 / DIN VDE 0482-267-2-1

Test procedure: Test sample should be between 500mg and 1000mg in weight. Sample is heated in a tube. Applied flame temperature is 800±10°C. The resulting gases are dissolved and halogen content is measured.

Test apparatus and burner/supply arrangement acc. to EN 50267-1

Test duration: 20 min at 800±10°C

Compliance condition: The amount of halogen acid is determined as mg of hydrochloric acid per gramm mass of sample. In the cases that amount of halogen acid is determined as less than 5mg/g or if the tested material is described as "zero halogen", the method specified in IEC 60754-2/EN 50267-2-2 should be used.



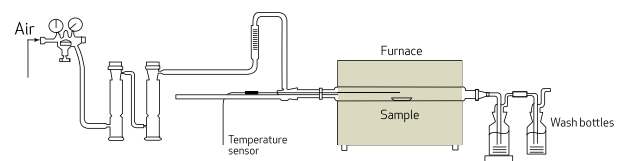
Determination of degree of acidity of gases for materials by measuring pH and conductivity IEC 60754-2 / EN 50267-2-2 / DIN VDE 0482-267-2-2

Test procedure: Test sample should be 1000mg in weight. Sample is heated in a tube. Applied flame temperature is min. 935°C. The resulting gases are dissolved in pure water and pH value and the conductivity are halogen content is measured.

Test apparatus and burner/supply arrangement acc. to EN 50267-1

Test duration: 30 min at 935°C

Compliance condition: The test is regarded as passed when the measured pH-value is ≥ 4,3 and the electrical conductivity 10 µS/mm.



Technical information

Abbreviations acc. to DIN VDE 0812 / 0815

Li	stranded wire conductor
Y	PVC insulation
H	HF insulation
(St)	electrostatic screen
C	tinned copper wire braided screen
Y	PVC sheath
H	HF sheath
Tp	twisted pair
J	installation cable
JE	installation cable for industrial electronic
Y	PVC insulation
H	HF insulation
(St)	electrostatic screen
Y	PVC sheath
H	HF sheath
Lg	in layers stranding
Bd	in bundle stranding

FE180 : Circuit integrity for 180 minutes under direct flame propagation acc. to DIN VDE 0472-814, IEC 60331

PH120 : Circuit integrity with shock for 120 minutes under direct flame propagation acc. to DIN VDE 0482-200, EN 50200

Colour code according to DIN 47100 with colour repetition as from the 45th core

Core No.	Core colour	Core No.	Core colour	Core No.	Core colour	Core No.	Core colour
1	white	17	white-grey	33	green-red	49	grey
2	brown	18	grey-brown	34	yellow-red	50	pink
3	green	19	white-pink	35	green-black	51	blue
4	yellow	20	pink-brown	36	yellow-black	52	red
5	grey	21	white-blue	37	grey-blue	53	black
6	pink	22	brown-blue	38	pink-blue	54	violet
7	blue	23	white-red	39	grey-red	55	grey-pink
8	red	24	brown-red	40	pink-red	56	red-blue
9	black	25	white-black	41	grey-black	57	white-green
10	violet	26	brown-black	42	pink-black	58	brown-green
11	grey-pink	27	grey-green	43	blue-black	59	white-yellow
12	red-blue	28	yellow-grey	44	red-black	60	yellow-brown
13	white-green	29	pink-green	45	white	61	white-grey
14	brown-green	30	yellow-pink	46	brown		
15	white-yellow	31	green-blue	47	green		
16	yellow-brown	32	yellow-blue	48	yellow		

Colour code according to DIN 47100 (twisted pairs) with colour repetition

Pair number	Pair colours			
	a-core	a-core		
1	23	45	white	brown
2	24	46	green	yellow
3	25	47	grey	pink
4	26	48	blue	red
5	27	49	black	violet
6	28	50	greypink	redblue
7	29	51	whitegreen	browngreen
8	30	52	whiteyellow	yellowbrown
9	31	53	whitegrey	greypink
10	32	54	whitepink	pinkbrown
11	33	55	whiteblue	brownblue
12	34	56	whitered	brownred
13	35	57	whiteblack	brownblack
14	36	58	greypink	yellowgrey
15	37	59	pinkgreen	yellowpink
16	38	60	greenblue	yellowblue
17	39	61	greenred	yellowred
18	40		greenblack	yellowblack
19	41		greyblue	pinkblue
20	42		greyred	pinkred
21	43		greyblack	pinkblack
22	44		blueblack	redblack

Copper stranded conductor structure according to DIN VDE 0295 and IEC 60228

Stranded conductor structure according to DIN VDE 0295 has been defined in conformity with IEC 60228 for conductor class 2 column 1, conductor class 5 column 3 and conductor Class 6 Column 4 as from 0,50 mm². The diameters of the individual wires of each conductor must not exceed the maximum value stated for each nominal cross-section, see table below

Cross section	Multi-wire round-section conductor VDE 0295 class 2 ²⁾ column 1	Multi-wire flexible strands Standard Structure column 2	Fine-wired flexible strands VDE 0295 class 5 ¹⁾ column 3	Ultra-fine-wired flexible strands			
				VDE 0295 class 6 ¹⁾ column 4	Standard structure		
					column 5	column 6	column 7
-	-	7x0,08	-	-	-	-	-
0,035	-	-	-	-	-	14x0,07	26x0,05
0,05	-	-	-	-	-	-	40x0,05
0,08	-	-	-	-	7x0,124	24x0,07*	-
0,09	-	-	18x0,10	18x0,10	18x0,10	36x0,07	72x0,05
0,14	-	-	14x0,15	32x0,10	32x0,10	65x0,07	128x0,05
0,25	-	7x0,25	19x0,15	42x0,10	42x0,10	88x0,07	174x0,05
0,34	-	7x0,27	12x0,20	21x0,15	48x0,10	100x0,07	194x0,05
0,38	-	7x0,30	16x0,20	28x0,15	64x0,10	131x0,07	256x0,05
0,50	7x0,30	7x0,37	24x0,20	42x0,15	96x0,10	195x0,07	384x0,05
0,75	7x0,37	7x0,43	32x0,20	56x0,15	128x0,10	260x0,07	512x0,05
1,0	7x0,43	7x0,52	30x0,25	84x0,15	192x0,10	392x0,07	768x0,05
1,5	7x0,52	19x0,41	50x0,25	140x0,15	320x0,10	651x0,07	1280x0,05
2,5	7x0,67	19x0,52	56x0,30	224x0,15	512x0,10	1040x0,07	-
4	7x0,85	19x0,64	84x0,30	192x0,20	768x0,10	1560x0,07	-
6	7x1,05	49x0,51	80x0,40	320x0,20	1280x0,10	2600x0,07	-
10	7x1,35	49x0,65	128x0,40	512x0,20	2048x0,10	4116x0,07	-
16	7x1,70	84x0,62	200x0,40	800x0,20	3200x0,10	6370x0,07	-
25	7x2,13	133x0,58	280x0,40	1120x0,20	4410x0,10	9100x0,07	-
35	7x2,52	133x0,69	400x0,40	705x0,30	-	-	-
50	19x1,83	189x0,69	356x0,50	990x0,30	-	Maximum permissible largest individual wire Ø	
70	19x2,17	259x0,69	485x0,50	1340x0,30	-	Nominal Maximum value for individual wire-Ø	
95	19x2,52	336x0,67	614x0,50	1690x0,30	-		
120	37x2,03	392x0,69	765x0,50	2123x0,30	-		
150	37x2,27	494x0,69	944x0,50	1470x0,40	-		
185	37x2,52	627x0,70	1225x0,50	1905x0,40	-	0,20	0,21
240	61x2,24	790x0,70	1530x0,50	2385x0,40	-	0,25	0,26
300	61x2,50	-	2034x0,50	-	-	0,30	0,31
400	61x2,89	-	1768x0,60	-	-	0,40	0,41
500	61x3,23	-	2228x0,60	-	-	0,50	0,51
630	91x2,97	-	-	-	-	0,60	0,61

*Alternative 19x0,08

Note:

¹⁾ DIN VDE 0295, in conformity with IEC 60228, specifies only the maximum individual-wire diameter for Conductor Class 5 and Conductor Class 6. The number of wires is in no case binding.

²⁾ For Conductor Class 2, however, the minimum number of individual wires in the round-section conductor and not the individual-wire diameter applies. The required maximum values for conductor resistance in each conductor at 20°C are definitive. The respective nominal cross-section for the specified maximum values must not be exceeded.

Explanatory notes on ultra-fine-wired stranded conductors, Class 6

Column 4 Standard flexible structure as per DIN VDE

Column 5 High flexibility

Column 6 Ultra-high flexibility

Column 7 Extreme flexibility

Technical information

AWG wires and stranded conductors

AWG No.	AWG- structure n x AWG	Cable structure n x wire-Ø mm	Conductor cross-section mm ²	Outer conductor Ø mm	Conductor resistance Ω/km	Conductor Weight kg/km
36	solid	solid	0,013	0,127	1460,0	0,116
36	7/44	7 x 0,05	0,014	0,152	1271,0	0,125
34	solid	solid	0,020	0,160	918,0	0,178
34	7/42	7 x 0,064	0,022	0,192	777,0	0,196
32	solid	solid	0,032	0,203	571,0	0,284
32	7/40	7 x 0,078	0,034	0,203	538,0	0,302
32	19/44	19 x 0,05	0,037	0,229	448,0	0,329
30	solid	solid	0,051	0,254	365,0	0,45
30	7/38	7 x 0,102	0,057	0,305	339,0	0,507
30	19/42	19 x 0,064	0,061	0,305	286,7	0,543
28	solid	solid	0,080	0,330	232,0	0,71
28	7/36	7 x 0,127	0,087	0,381	213,0	0,774
28	19/40	19 x 0,078	0,091	0,406	186,0	0,81
27	7/35	7 x 0,142	0,111	0,457	179,0	0,988
26	solid	solid	0,128	0,404	143,0	1,14
26	10/36	10 x 0,127	0,127	0,533	137,0	1,13
26	19/38	19 x 0,102	0,155	0,508	113,0	1,38
26	7/34	7 x 0,160	0,141	0,483	122,0	1,25
24	solid	solid	0,205	0,511	89,4	1,82
24	7/32	7 x 0,203	0,227	0,610	76,4	2,02
24	10/34	10 x 0,160	0,201	0,582	85,6	1,79
24	19/36	19 x 0,127	0,241	0,610	69,2	2,14
24	41/40	41 x 0,078	0,196	0,582	84,0	1,74
22	solid	solid	0,324	0,643	55,3	2,88
22	7/30	7 x 0,254	0,355	0,762	48,4	3,16
22	19/34	19 x 0,160	0,382	0,787	45,1	3,40
22	26/36	26 x 0,127	0,330	0,762	52,3	2,94
20	solid	solid	0,519	0,813	34,6	4,61
20	7/28	7 x 0,320	0,562	0,965	33,8	5,00
20	10/30	10 x 0,254	0,507	0,889	33,9	4,51
20	19/32	19 x 0,203	0,615	0,940	28,3	5,47
20	26/34	26 x 0,160	0,523	0,914	33,0	4,65
20	41/36	41 x 0,127	0,520	0,914	32,9	4,63
18	solid	solid	0,823	1,020	21,8	7,32
18	7/26	7 x 0,404	0,897	1,219	19,2	7,98
18	16/30	16 x 0,254	0,811	1,194	21,3	7,22
18	19/30	19 x 0,254	0,963	1,245	17,9	8,57
18	41/34	41 x 0,160	0,824	1,194	20,9	7,33
18	65/36	65 x 0,127	0,823	1,194	21,0	7,32
16	solid	solid	1,310	1,290	13,7	11,66
16	7/24	7 x 0,511	1,440	1,524	12,0	12,81
16	65/34	65 x 0,160	1,310	1,499	13,2	11,65
16	26/30	26 x 0,254	1,317	1,499	13,1	11,72
16	19/29	19 x 0,287	1,229	1,473	14,0	10,94
16	105/36	105 x 0,127	1,330	1,499	13,1	11,84
14	solid	solid	2,080	1,630	8,6	18,51
14	7/22	7 x 0,643	2,238	1,854	7,6	19,92
14	19/27	19 x 0,361	1,945	1,854	8,9	17,31
14	41/30	41 x 0,254	2,078	1,854	8,3	18,49
14	105/34	105 x 0,160	2,111	1,854	8,2	18,79

AWG No.	AWG- structure n x AWG	Cable structure n x wire-Ø mm	Conductor cross-section mm ²	Outer conductor Ø mm	Conductor resistance Ω/km	Conductor Weight kg/km
12	solid	solid	3,31	2,05	5,4	29,46
12	7/20	7 x 0,813	3,63	2,438	4,8	32,30
12	19/25	19 x 0,455	3,09	2,369	5,6	27,50
12	65/30	65 x 0,254	3,292	2,413	5,7	29,29
12	165/34	165 x 0,60	3,316	2,413	5,2	29,51
10	solid	solid	5,26	2,59	3,4	46,81
10	37/26	37 x 0,404	4,74	2,921	3,6	42,18
10	49/27	49 x 0,363	5,068	2,946	3,6	45,10
10	105/30	105 x 0,254	5,317	2,946	3,2	47,32
8	49/25	49 x 0,455	7,963	3,734	2,2	70,87
8	133/29	133 x 0,287	8,604	3,734	2,0	76,57
8	655/36	655 x 0,127	8,297	3,734	2,0	73,84
4	133/25	133 x 0,455	21,625	5,898	0,80	192,46
4	259/27	259 x 0,363	26,804	5,898	0,66	238,55
4	1666/36	1666 x 0,127	21,104	5,898	0,82	187,82
2	133/23	133 x 0,574	34,416	7,417	0,50	306,30
2	259/26	259 x 0,404	33,201	7,417	0,52	295,49
2	665/30	665 x 0,254	33,696	7,417	0,52	299,89
2	2646/36	2646 x 0,127	33,518	7,417	0,52	298,31
1	133/22	133 x 0,643	43,187	8,331	0,40	384,37
1	259/2	259 x 0,455	42,112	8,331	0,41	374,80
1	817/30	817 x 0,254	41,397	8,331	0,42	368,43
1	2109/34	2109 x 0,160	42,403	8,331	0,41	377,39
1/0	133/21	133 x 0,724	54,75	9,347	0,31	487,28
1/0	259/24	259 x 0,511	53,116	9,347	0,32	472,73
2/0	133/20	133 x 0,813	69,043	10,516	0,25	614,48
2/0	259/23	259 x 0,574	67,021	10,516	0,25	596,49
3/0	259/22	259 x 0,643	84,102	11,786	0,20	748,51
3/0	427/24	427 x 0,511	87,570	11,786	0,20	779,37
4/0	259/21	259 x 0,724	106,626	13,259	0,16	948,97
4/0	427/23	427 x 0,574	110,494	13,259	0,15	983,39

AWG wires (solid conductors)

AWG No.	wire-Ø mm	AWG No.	wire-Ø mm	AWG No.	wire-Ø mm
44	0,050	26	0,404	10	2,588
41	0,070	25	0,455	9	2,906
40	0,079	24	0,511	8	3,268
39	0,089	23	0,574	7	3,665
38	0,102	22	0,643	6	4,115
37	0,114	21	0,724	5	4,620
36	0,127	20	0,813	4	5,189
35	0,142	19	0,912	3	5,827
34	0,160	18	1,024	2	6,543
33	0,180	17	1,151	1	7,348
32	0,203	16	1,290	1/0	8,252
31	0,226	15	1,450	2/0	9,266
30	0,254	14	1,628	3/0	10,404
29	0,287	13	1,829	4/0	11,684
28	0,320	12	2,052		
27	0,363	11	2,304		

Technical information

Conductor resistance data according to VDE 0295 and IEC 60228

Conductor dimensions	High-voltage cables						Welding cable	
	Cu conductors				Al conductors		Cu conductors	
	consisting of tin-plated wires		consisting of bright wires		consisting of bright wires		consisting of bright wires	consisting of tin-plated wires
Nominal cross-section mm ²	Class 1 Class 2 Ω/km	Class 5 Class 6 Ω/km	Class 1 Class 2 Ω/km	Class 5 Class 6 Ω/km	Class 1 Ω/km	Class 2 Ω/km	Ω/km	Ω/km
0,05	-	~380,0	-	~360,0	-	-	-	-
0,08	-	~240,0	-	~230,0	-	-	-	-
0,09	-	~230,0	-	~215,0	-	-	-	-
0,14	-	~140,0	-	~138,0	-	-	-	-
0,22	-	~96,8	-	~95,0	-	-	-	-
0,25	-	~79,3	-	~77,8	-	-	-	-
0,34	-	~57,1	-	~56,0	-	-	-	-
0,50	36,7	40,1	36,0	39,0	-	-	-	-
0,75	24,8	26,7	24,5	26,0	-	-	-	-
1,0	18,2	20,0	18,1	19,5	-	-	-	-
1,5	12,2	13,7	12,1	13,3	-	-	-	-
2,5	7,56	8,21	7,41	7,98	-	-	-	-
4,0	4,70	5,09	4,61	4,95	-	-	-	-
6,0	3,11	3,39	3,08	3,30	-	-	-	-
10	1,84	1,95	1,83	1,91	-	-	-	-
16	1,16	1,24	1,15	1,21	-	1,912)	1,16	1,19
25	0,734	0,795	0,7271)	0,780	1,20	1,20	0,758	0,780
35	0,529	0,565	0,5241)	0,554	0,868	0,868	0,536	0,552
50	0,391	0,393	0,3871)	0,386	0,641	0,641	0,379	0,390
70	0,270	0,277	0,2681)	0,272	0,443	0,443	0,268	0,276
95	0,195	0,210	0,1931)	0,206	0,320	0,320	0,198	0,204
120	0,154	0,164	0,1531)	0,161	0,253	0,253	0,155	0,159
150	0,126	0,132	0,1241)	0,129	0,206	0,206	0,125	0,129
185	0,100	0,108	0,0991	0,106	0,164	0,164	0,102	0,105
240	0,0762	0,0817	0,0754	0,0801	0,125	0,125	-	-
300	0,0607	0,0654	0,0601	0,0641	0,100	0,100	-	-
400	0,0475	0,0495	0,0470	0,0486	-	0,0778	-	-
500	0,0369	0,0391	0,0366	0,0384	-	0,0605	-	-
630	0,0286	0,0292	0,0283	0,0287	-	0,0469	-	-

¹⁾ applies to mineral insulated Class 1 cables

²⁾ applies only to conductors with reduced cross-section for NAYCWY 4 x 25/16

Explanatory notes

Class 1 - for single-wire conductors

Class 2 - for multi-wire conductors

Class 5 - for fine-wired conductors

Class 6 - for ultra-fine-wired conductors

ROHS DIRECTIVE 2002/95/EC

EU legislation restricting the use of hazardous substances in electrical and electronic equipment (RoHS Directive 2002/95/EC) and promoting the collection and recycling of such equipment (WEEE Directive 2002/96/EC) has been in force since February 2003.

REACH REGULATION (EC) No 1907/2006

The Registration, Evaluation, Authorisation of Chemicals (REACH) is a European Union Regulation of December 2006 which was seven years in the making and has been called the EU's most complex piece of legislation

Polyvinylchloride (PVC): A general purpose thermoplastic used for wire and cable insulation and jackets. PVC is a synthetic material containing halogen (unlike Polyethylene). Halogens (salt creators) are chlorine, bromine, fluorine, iodine and astat. PVC jacketed cables are flame-retardant. Synthetic materials containing halogen, form highly-poisonous gases in case of fire. When mixed with water these gases form harmful corrosive acids.

Polyethylene (PE): A polyolefin thermoplastic material having excellent electrical properties. PE is a halogen-free synthetic material that burns easily. By adding additives, PE can be made flame retardant and get low smoke characteristics.

Halogen free coating material (HF): A halogen is a salt creator. Chlorine, bromine, fluorine and astat are listed in the periodic table of elements. Cables with a PVC (polyvinyl chloride) sheath are flame retardant. Halogen-free sheath materials don't contain any halogens. Therefore no corrosive gases are emitted from the cable in the event of a fire, the smoke emission is reduced to a minimum level and fire propagation is avoided. There are several identifications used for HF materials in the market:

HFFR, FRNC, LSOH and LSZH

HF : Halogen Free
FR : Flame Retardant
NC : Non Corrosive
LS : Low Smoke
OH or ZH : Zero Halogen

Halogen-free Security Cables and Wires Application

The application of halogen-free security cables and wires are specified more and more with increasing numbers for the buildings where people gather or everywhere, where safety consciousness to protect the human life and valuable materials take a special significance. For example,

- Hospitals, airports, in multi-storey buildings, stores and shops, hotels, theaters, cinemas, schools etc.
- Fire warning plants, alarm systems, ventilation systems, escalators, lifts, safety lights, operation and intensive stations, maintenance equipment
- Underground railways and other railway plants
- Data processing installations
- Power stations and industrial plants with high valuable machines and materials or risky potentials
- Mining works
- Shipbuilding and offshore plants
- Emergency power supply works



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