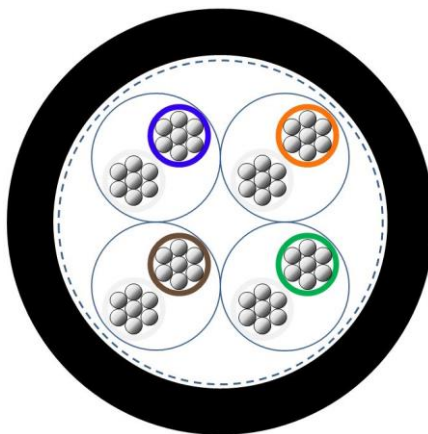


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Application

ETHERLINE® TRAIN FLEX Cat. 7 PE 4x2x24/7 AWG is an electron beam cross-linked, highly flame retardant and halogen free Category 7 high speed data transmission cable for rolling stock applications. The cable is designed for fixed installation and flexible applications. They are particularly used in areas, where human and animal life is exposed to high risk of fire hazards as well as valuable property. The high quality screen ensures high transmission reliability of data transfer in electromagnetically polluted areas. The cable is oil-, fuel-, acid- and alkali resistant acc. to EN 50264-3-1.



Design

Certification	classification EN 45545-2: Hazard Level HL1, HL2, HL3 classification acid and alkaline resistance acc. to EN 50264-1, EM 104 NF F 16-101: Internal: Vehicle Categories A1, A2, B External: Vehicle Categories A1, A2, B Category C for flame propagation Category F0 for smoke density
Conductor	stranded tinned copper 24/7 AWG (nom. 0.22 mm ²) conductor diameter: nom. 0.6 mm
Insulation	PE (electron beam cross-linked), core Ø ca. 1.4 mm
Core identification code	pair 1: white/blue + blue; pair 2: white/orange + orange; pair 3: white/green + green; pair 4: white/brown + brown
Stranding	2 cores stranded to pair screened pairs stranded to bundle
Taping	wrapping (optional) thin non-woven tape, longitudinally applied (used for improved stripping characteristics)
Screen	pair screening plastic laminated aluminum foil/braid of tinned copper wires, coverage ca. 85 %
Outer sheath	electron beam cross-linked polymer compound, halogen free and flame retardant, EM 104 acc. to EN 50264-1 black (similar to RAL 9005), outer Ø ca. 8.4 mm

Electrical properties at 20 °C

Loop resistance	max. 173 Ω/km
Test voltage	conductor/conductor 1000 V conductor/screen 1000 V
Maximum operating voltage	125 V (not for power purposes)
Insulation resistance	min. 5 GΩ x km
Capacitive coupling	nom. 48 nF/km (at 800 Hz)

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Transmission properties at 20°C

The transmission characteristics meet the requirements of the IEC 61156-6 for category 7 and the requirements of the PROFINET Cabling and Interconnection Technology Guideline.

Frequency	(max.) Phase delay	(max.) Differential delay	(max.) Attenuation	(min.) TCL Level 1	(min.) EL TCTL Level 1	(min.) NEXT	(min.) PS NEXT	(min.) ACR-F	(min.) PS ACR-F	Char. Impedance	(min.) RL
f [MHz]	[ns/ 100 m]	[ns/ 100 m]	[dB/ 100 m]	[dB]	[dB]	[dB]	[dB]	[dB/ 100 m]	[dB/ 100 m]	[Ohm]	[dB]
4	552.0	20.0	5.6	34.0	23.0	78.0	75.0	78.0	75.0	—	23.0
10	545.4	20.0	8.8	30.0	15.0	78.0	75.0	74.0	71.0	—	25.0
20	542.0	20.0	12.4	27.0	9.0	78.0	75.0	68.0	65.0	—	25.0
62.5	538.6	20.0	22.3	22.0	—	75.5	72.5	58.1	55.1	—	20.7
100	537.6	20.0	28.5	20.0	—	72.4	69.4	54.0	51.0	100 ± 5	19.0
200	536.5	20.0	41.2	17.0	—	67.9	64.9	48.0	45.0	—	16.4
250	536.3	20.0	46.5	16.0	—	66.4	63.4	46.0	43.0	—	15.6
500	535.6	20.0	67.9	—	—	61.9	58.9	40.0	37.0	—	15.6
600	535.5	20.0	75.1	—	—	60.7	57.7	38.4	35.4	—	15.6

Mechanical and thermal properties

Minimum bending radius	moved: 10 x cable Ø fixed installation: 8 x cable Ø
Temperature range	moved: -35° C up to +90° C fixed installation: -45° C up to +90° C
Flammability	flame retardant acc. to IEC 60332-1-2 no flame propagation > 6 mm and <12 mm: acc. to IEC 60332-3-25 / acc. to NF C 32-070, Category C1 and C2
Halogen free	acc. to EN 60684-2 (fluorine) acc. to IEC 60754-1; EN 60754-1; EN 50267-2-1 (chlorine and bromine)
Corrosivity of gases	acc. to EN 50264-1, pH ≥ 4.3 and conductivity ≤ 10µS/mm acc. to IEC 60754-2; EN 60754-2; EN 50267-2-2
Smoke density	acc. to EN 50264-1 (light transmission: min. 70%) acc. to IEC 61034-2; EN 61034-2 / acc. to NF X 10-702
Toxicity	acc. to EN 50264-1 (< 3) acc. to EN 50305 / acc. to NF X 70-100
Oil resistance	acc. to EN 50264-1, EM 104

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UV resistance	acc. to EN 50525-1 (VDE 0285-525-1) are cables with black sheath suitable for permanent outdoor use.
Ozone resistance	acc. to EN 50264-3-2, method A or B acc. to EN 50305
Fuel resistance	acc. to EN 50264-1, EM 104
General requirements	This cable is conform to EU-Directive 2014/35/EU (Low Voltage Directive) and to EU-Directive 2011/65/EU (RoHS, Restriction of the use of certain hazardous substances).
Environmental information	These cables meet the substance-specific requirements of the EU Directive 2011/65/EU (RoHS).

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