

Electric Vehicle High-Voltage Cables



Shielded Single-Core HV Cable for Electric Vehicles [EVP]

Standards: ISO 19642-5 (HV unshielded reference), ISO 19642-9 (shielded), ISO 6722-1 (test methods), QC/T 1037-2016; ref. LV 216-2

Technical Data

Rated voltage: AC 1000 V / DC 1500 V

Temperature class: T3 (-40 °C to +125 °C, 3 000 h) — "-C" variant; T4 (-40 °C to +150 °C, 3 000 h) — "-D" variant

Conductor material: annealed bare copper, flexible stranded (Class 5/6 per ISO 6722-1 / IEC 60228); Class 2 resistance limits applied per QC/T 1037

Insulation material: cross-linked polyethylene (XLPE), orange (RAL 2003)

Shield: tinned copper wire braid, coverage $\geq 85\%$

Sheath material: cross-linked polyethylene (XLPE), orange — EV HV identification per ISO 19642

Dielectric voltage test: 5 kV AC / 5 min, no breakdown

Insulation-fault spark test: 8 kV AC for 1500 V DC rating

Short-term aging: 240 h per QC/T 1037

Long-term aging: 3 000 h per QC/T 1037

Flame test: complies with QC/T 1037; self-extinguishing per ISO 6722-1

Oil resistance: complies with QC/T 1037 (IRM 902 / IRM 903 immersion)

Tear strength: > 20 N/mm

Min. bending radius: $4 \times OD$ when $OD < 15$ mm; $6 \times OD$ when $OD \geq 15$ mm

Environmental compliance: RoHS 2.0 and REACH

Application

EVP cables transmit high-voltage DC and AC power inside electric and hybrid-electric vehicles, and between vehicle and DC fast-charging infrastructure. Typical installations: battery pack interconnects, battery-to-motor controller, on-board charger (OBC) feeds, DC-DC converter and PDU links, and CCS / GB/T charge inlets at AC 1000 V / DC 1500 V. The braid screen suppresses electromagnetic interference from high-current switching; XLPE insulation and sheath withstand vehicle service stresses — oil, fuel, abrasion, vibration, wide thermal cycling.

Construction

- ① Flexible stranded bare copper conductor (Class 5/6) ② Cross-linked polyethylene (XLPE) insulation, orange
③ Tinned copper wire braid screen (coverage $\geq 85\%$) ④ Cross-linked polyethylene (XLPE) outer sheath, orange

DIMENSION & WEIGHT					ELECTRICAL PROPERTIES			
Nominal Cross Section	Conductor Stranded OD	Insulation Thickness (nom)	Overall Diameter (approx)	Net Weight (approx)	Delivery Length	Max. Conductor Resistance 20°C	Permissible Ampacity (in-vehicle, 85°C)	Short-Circuit 1 s
mm ²	mm	mm	mm	kg/km	m	mΩ/m	A	kA
10	4.50	1.0	9.50	180	500	1.820	70	1.2
16	5.60	1.0	11.30	256	200	1.160	95	2.0
25	7.20	1.2	13.50	366	200	0.743	130	3.1
35	8.30	1.2	14.50	467	200	0.527	160	4.3
50	10.10	1.4	17.00	642	100	0.368	210	6.2
70	12.10	1.4	19.00	850	100	0.259	260	8.7
95	14.50	1.6	21.60	1115	100	0.196	320	11.8
120	15.90	1.6	23.00	1365	100	0.153	370	14.9

Note: Maximum DC conductor resistance values are the IEC 60228 Class 2 limits applied per QC/T 1037 (the cable uses flexible Class 5/6 stranding but is specified against the Class 2 resistance ceiling). Permissible ampacity is the continuous current for in-vehicle bundled installation at 85 °C ambient with T3 (125 °C) conductor — apply further derating for harness bundling beyond reference, restricted routing (pass-through, conduit), and elevated ambient (engine-bay zones). The T4 (150 °C) variant supports higher continuous current; consult OEM derating tables. Short-circuit capacity is calculated for 1 s adiabatic heating from 125 °C to 250 °C ($k \approx 124 \text{ A} \cdot \text{s}^{0.5}/\text{mm}^2$ for Cu/XLPE). Dimensions and weights are approximate, for reference only; subject to change due to technical progress.