FEICHUN SPECIAL CABLES · 飞纯特种电缆

TDS · FLEXIBLE RUBBER CABLE | 44 × 2.5 mm² | Cu / EPR / CR · Strain Element 20 kN | 0.6/1 kV · Replacement Cable

Heavy-Duty Flexible Cable 44 × 2.5 mm², 0.6/1 kV, 20 kN

Technical specification for a 44-core, fine-wire copper, EPR insulated, reeling / crane duty cable with central steel wire rope strain element (20 kN permissible tensile load), anti-torsion reinforcement braid and heavy-duty oil-resistant rubber outer sheath. FeiChun replacement for Cordaflex (SMK)-V 0.6/1 kV 44×2.5 (20 kN).

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01 Scope and Replacement Basis

This specification covers the design, materials, construction, testing, marking and packing of the **FeiChun 44 × 2.5 mm², 0.6/1 kV flexible cable with 20 kN strain element**. The cable is intended as a form-, fit- and function replacement for **Cordaflex (SMK)-V 0.6/1 kV 44×2.5 (20 kN)** in cable-reel and festoon systems of cranes, container handling equipment (spreader / trolley feeds), ship and bulk loaders and similar mobile machinery, where control and auxiliary power circuits are supplied through a load-bearing multicore cable.

- 44 fine-wire (Class 5) copper cores of 2.5 mm² in three concentric layers around a central galvanized steel wire rope; the rope carries the tensile load so that the copper cores remain strain-free.
- EPR core insulation for 90 °C conductor temperature; counter-wound layers and an anti-torsion braid for a torsion-balanced, kink-resistant construction.
- Heavy-duty polychloroprene-type (CR) outer sheath: oil, abrasion, tear, UV / ozone and weather resistant; flame retardant.

RATED VOLTAGE UO/U
0.6/1 kV

CONSTRUCTION
44 × 2.5 mm²

PERMISSIBLE TENSILE LOAD
20 kN

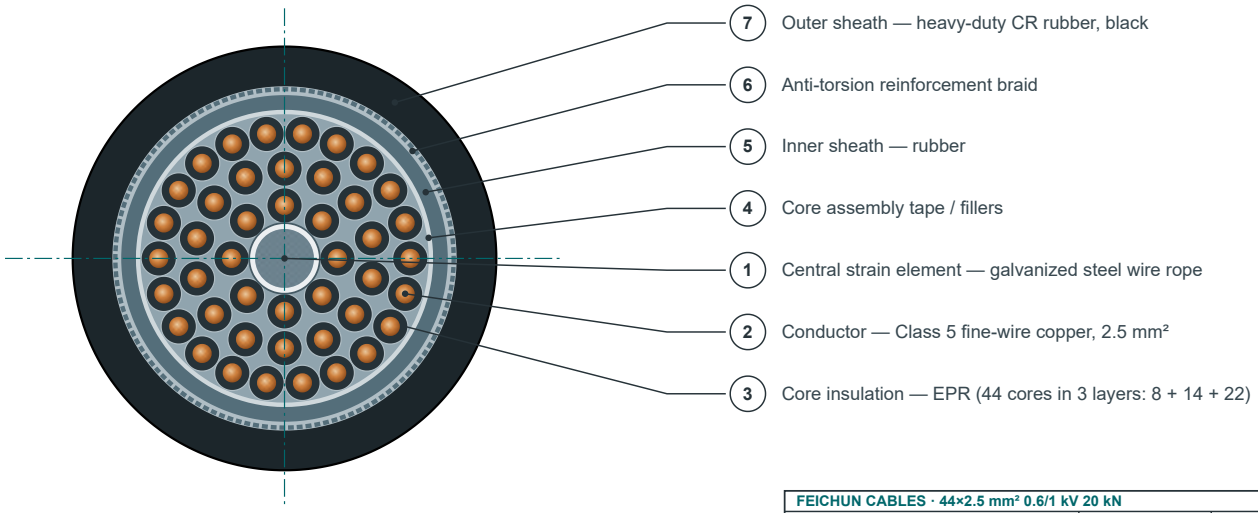
WEIGHT (APPROX.)
≈ 3.0–3.5 kg/m

Item	Reference (existing cable)	FeiChun replacement
Type	Cordaflex (SMK)-V	**FC-CRN 44×2.5 / 20 kN (this document)**
Voltage	0.6/1 kV	**0.6/1 kV**
Cores × cross-section	44 × 2.5 mm²	**44 × 2.5 mm², Class 5**
Tensile load	20 kN	**20 kN (central steel wire rope)**

Cordaflex is a trademark of its respective owner. The FeiChun cable is an equivalent product built to the electrical and mechanical data above; construction details not given on the reference designation are marked in Section 10 for confirmation.

02 Cable Construction — Cross-Section

Fig. 1 · Cross-section · 44 × 2.5 mm² 0.6/1 kV, 20 kN (schematic, not to scale)



FEICHUN CABLES · 44×2.5 mm² 0.6/1 kV 20 kN		
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Pos.	Component	Material / requirement
1	Strain element	Central non-rotating galvanized steel wire rope, ≈ 8 mm, with plastic cover; permissible tensile load 20 kN
2	Conductor	Fine-wire annealed plain copper, **IEC 60228 Class 5**, 2.5 mm²; tinned copper available as option
3	Core insulation	EPR (ethylene-propylene rubber, heavy-duty type), nominal thickness ≈ 0.8 mm; cores identified by white numerals 1…44 on black (or as agreed)
4	Core assembly	Cores stranded in 3 layers (8 + 14 + 22) with alternating lay direction around the strain element; rubber / non-hygroscopic fillers; separator tape over the assembly
5	Inner sheath	Rubber compound, extruded over the core assembly, pressure-filled between the cores
6	Reinforcement braid	Counter-lay polyamide / polyester yarn braid for torsional stability and mechanical protection
7	Outer sheath	Heavy-duty polychloroprene-type (CR) rubber, **black**; oil, abrasion, tear and weather resistant

Designation. FC-CRN-Cu/EPR/CR 44×2.5 mm² 0.6/1 kV (20 kN) = copper conductor / EPR insulation / central strain element / reinforcement braid / CR outer sheath. The cross-section figure is schematic; final dimensions and core layout are confirmed by the manufacturer's production drawing.

03 Applicable Standards

Standard	Subject
IEC 60228	Conductors of insulated cables (Class 5, flexible)
IEC 60245 / HD 22 series	Rubber insulated cables, rated voltages up to and including 450/750 V — insulation / sheath compound and test method reference (EPR, CR)
IEC 60502-1	Power cables with extruded insulation up to 1 kV — voltage rating and electrical test reference
IEC 60811 series	Test methods for insulating and sheathing materials
IEC 60332-1-2	Flame propagation — single vertical cable
DIN VDE 0298-3 / -4	Current-carrying capacity and permissible tensile loads of flexible cables (reference for ratings)
IEC 60754 / 61034	Halogen content and smoke density (only for the halogen-free option, Section 06)

04 Dimensions and Weights (Approximate)

Parameter	Value
Number of cores	**44**
Nominal cross-section	**2.5 mm²**
Conductor, Class 5, wire diameter	**≤ 0.26 mm**
Conductor diameter (approx.)	**2.0–2.2 mm**
Insulation thickness, nominal	**≈ 0.8 mm**
Core diameter (approx.)	**3.7–4.1 mm**
Strain element diameter	**≈ 8 mm**
Core layers (inside → outside)	**8 + 14 + 22**

Parameter	Value
Core assembly diameter	≈ 32–34 mm
Inner sheath thickness	≈ 1.5–2.0 mm
Reinforcement braid	≈ 1 mm
Outer sheath thickness	≈ 4.5 mm
Overall diameter	≈ 46–50 mm
Weight	≈ 3.0–3.5 kg/m
Min. bending radius, fixed	6 × overall diameter
Min. bending radius, reeling / festoon	10 × overall diameter

Values are approximate and are confirmed by the manufacturer's final design data sheet and routine test report. Overall diameter tolerance ± 1.5 mm.

05 Electrical Characteristics

Parameter	Value
Rated voltage Uo/U	0.6/1 kV (AC); max. 1.2 kV AC / 1.8 kV DC
Max. DC resistance at 20 °C (Class 5, plain Cu)	7.98 Ω/km
Max. DC resistance at 20 °C (tinned option)	8.21 Ω/km
Test voltage, core / core, 5 min (water-immersed)	3.5 kV AC

Parameter	Value
Max. conductor temp., normal operation	90 °C
Max. conductor temp., short circuit (≤ 5 s)	250 °C
Short-circuit current per core, 1 s	≈ 0.36 kA (k = 143)
Current rating per core (approx.)	≈ 26 A (3 loaded cores, 30 °C, cable free in air) ≈ 9 A (all 44 cores loaded, factor ≈ 0.35)

Current ratings are indicative only. Cable-reel duty requires additional derating for wound layers on the drum (see DIN VDE 0298-3 reeling factors) and depends on ambient temperature.

06 Mechanical, Environmental and Fire Requirements

Property	Requirement
Permissible tensile load, in operation	**20 kN, carried only by the central steel wire rope**
Strain element breaking force	**≥ 40 kN (safety factor ≥ 2 on permissible load; to be confirmed with customer)**
Torsion behaviour	**Counter-lay layers + reinforcement braid; torsion-balanced, free of kinking and "birdcaging" under rated load**
Ambient temperature	**Fixed: −40 °C to +90 °C · Moving / reeling: −25 °C to +60 °C**
Sheath resistance	**Oil, grease, abrasion, tear propagation, UV, ozone and weather resistant**
Flame retardancy	**IEC 60332-1-2 (single cable)**

Optional materials (per project requirement)

Item	Option
Outer sheath	**Polyurethane (PUR), halogen-free, for higher abrasion and cut resistance — or halogen-free rubber (HFFR) sheath for low smoke zero halogen requirements**
Conductor	**Tinned Class 5 copper**
Strain element	**Aramid (Kevlar-type) strain element instead of steel rope, where non-metallic construction is required**
Core identification	**One green-yellow core (PE) within the 44 cores — see Section 10**

07 Tests

Routine tests (every drum length)

- Conductor resistance measurement (all 44 cores)
- Voltage test 3.5 kV AC, 5 min
- Insulation resistance
- Core continuity and numbering check
- Visual inspection, diameter and marking check

Sample tests

- Conductor examination (wire diameter, construction)
- Dimensions of insulation and sheaths
- Tensile and elongation of insulation and sheath, before and after ageing
- Hot-set test of EPR insulation
- Oil resistance and tear resistance of the outer sheath
- Steel wire rope: breaking force and zinc coating

Type / special tests. Tensile test under 20 kN with measurement of core elongation and residual deformation; torsion test; reeling (bending) test on a test rig with the number of cycles to be agreed with the customer. Reports provided on request.

08 Marking, Packing and Delivery

Item	Requirement
Required quantity	**To be confirmed by the buyer**
Length per drum	**As agreed (cable ≈ 3.0–3.5 kg/m: 500 m ≈ 1.5–1.75 t, excl. drum)**
Drum type	**Steel or heavy-duty wooden-steel drum; core diameter ≥ 20 × cable diameter**
Marking on outer sheath	**Embossed or printed at intervals ≤ 1 m: FEICHUN CABLE – 44×2.5 – 0.6/1 kV – 20 kN – [YEAR] – [METRE MARK]**
Core identification	**White numerals 1…44 on black cores (or as agreed)**
Drum marking	**Manufacturer, cable type, size, voltage, length, gross / net weight, drum number, rolling direction arrow**
Cable ends	**Sealed with heat-shrink end caps; end of strain element protected**

09 Documents, Warranty and Product Identity

- Cable data sheet and drawing
- Routine test certificates (per drum); strain element test certificate
- Type / special test reports on request
- Material certificates (copper, rubber compounds, steel wire rope)
- Packing list, Certificate of Origin, Quality Certificate

Item	Statement
Brand / origin	FeiChun · Made in China
Product status	Newly manufactured FeiChun-brand cable built to the specified configuration. It is an equivalent / alternative product, not the original brand of the existing cable; no OEM claim is made.
Warranty	12 months from delivery, for defects not caused by misuse or improper installation
Lead time	To be quoted after confirmation of length and open points (made to order)

10 Points to Confirm Before Production

1. **Earth core:** "44×2.5" is read as 44 cores without a separate green-yellow conductor. Please confirm whether one of the 44 cores must be green-yellow (44G2.5 type).
2. **Designation "-V":** the exact meaning of the suffix and of "(SMK)" in the reference type is not given. Please confirm any special requirement (e.g. sheath material, halogen-free, offshore / marine approval) or send the reference datasheet.

3. **Tensile load:** 20 kN is read as the permissible working load of the strain element (breaking force ≥ 40 kN). Please confirm that it is not the minimum breaking load.
4. **Application data:** drum / festoon type, drum core diameter, reeling speed and acceleration, free hanging length and number of reeling cycles, to verify the design life and current derating.
5. **Outer sheath:** CR rubber (standard), PUR or halogen-free — and sheath colour (black standard).
6. **Core marking:** numbered cores, or colour-coded cores per a specific table.
7. **Quantity and length per drum** for the quotation.

Prepared by: Design engineer	Checked by: Technical / QA Dept.	Approved by: Technical director

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