ANHUI FEICHUN SPECIAL CABLE CO., LTD.
安徽飞纯特种电缆有限公司
HEAVY INDUSTRIAL & COMPOSITE REELING CABLE SPECIALIST · CRANE · GANTRY · PORT TERMINAL · EXCAVATOR · WWW.FEICHUNCABLES.COM

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CLASS Product Data Sheet | Composite Reeling Cable · Power + Control + Fibre
STANDARDS VDE 0250 | IEC 60228 | IEC 60502 | IEC 60793 (OFE) | DIN VDE 0298-4

✦ FEICHUN COMPOSITE
REELING CABLE DATA SHEET

Composite Reel
Power + Ctrl + OFE

3×70 + 1×35 + 4×1.5 + 6G-Fibre
0.6/1 kV · 246 A Base · OD ≈ 48 mm
Armoured · Anti-Torsion · Oil Resistant

Feichun Heavy Cable Division ·
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COMPOSITE REELING & TRAILING CABLE — POWER DISTRIBUTION / CONTROL SIGNALLING / FIBRE-OPTIC DATA

(N)SHTOEU-J · 3×70+1×35+4×1.5+OFE6 · 0.6/1 kV

Composite heavy-duty flexible reeling cable combining **three 70 mm² main power conductors**, one **35 mm² protective earth**, four **1.5 mm² control conductors**, and one **6-fibre multimode optical fibre element (OFE6 62.5/125 µm)**. Oil-resistant, torsion-stable construction with integrated aramid tensile reinforcement for gantry crane, stacker-reclaimer, and dragline drum-reel duty at travel speeds to 180 m/min. Rated 0.6/1 kV per VDE 0250; conductor maximum operating temperature +90 °C. Rheycord® (RTS) equivalent.

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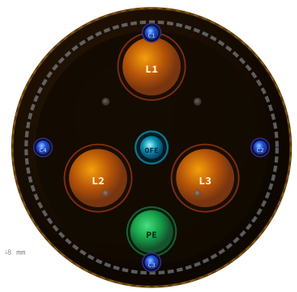
FC Rubber Sheath | Torsion-Resistant | Oil-Resistant | OFE Integrated | VDE 0250 | 0.6/1 kV

CABLE OVERVIEW & APPLICATION

(N)SHTOEU-J — RHEYCORD® EQUIVALENT COMPOSITE DRUM-REEL CABLE

The **(N)SHTOEU-J** is a high-performance composite flexible cable engineered for mobile industrial equipment requiring integrated power, signal, and data transmission. Developed as a fully equivalent alternative to the industry-standard Nexans Rheycord® (RTS) reeling cable, the Feichun composite design unifies mains power delivery, protective earthing, process control signalling, and high-bandwidth fibre-optic data communications within a single torsion-engineered cable structure. This monolithic approach eliminates the cable bundle complexity inherent in running separate power and data cables over the same reel drum. The designation "**TOEU-J**" encodes oil resistance (O), the polyethylene internal tube protecting the optical fibre (E), and the outer toughened rubber sheath (EU — a designation for special elastomeric compound). The integrated **OFE6** (6-fibre Optical Fibre Element) enables real-time video surveillance and gigabit-class data links between control cabins and mobile machine PLCs across the full reel cable span with no electromagnetic interference from the 0.6/1 kV power conductors.

0.6/1 kV (U₀/U) | OFE 6G 62.5/125 | VDE 0250



(N)SHTOEU-J · Schematic Cross-Section (Not to scale)
3× L1/L2/L3 Phase (amber) · 1× PE Earth (green) · 4× Control (blue) · OFE Tube (cyan)

- **L1, L2, L3** — 70 mm² Phase (×3)
- **PE** — 35 mm² Earth Conductor
- **C1–C4** — 1.5 mm² Control (×4)
- **OFE6** — 6G 62.5/125 µm Fibre
- Aramid / Tensile elements
- Elastomeric outer sheath

DESIGNATION DECODE — (N)SHTOEU-J

(N)	Rubber inner sheath / elastomeric bedding — not PVC
S	Screened — individual conductive shield on power cores
H	Highly flexible stranded construction

POWER CONDUCTORS — 3×70 MM² + 1×35 MM² PE · 0.6/1 KV

ELECTRICAL & MECHANICAL — CORE DATA

CORE SPECIFICATION SUMMARY	
Rated voltage (U_0/U)	0.6/1 kV (System max 1.1 kV)
Power core configuration	3 × 70 mm² (L1, L2, L3)
Earth conductor	1 × 35 mm² (PE, G/Y)
Control conductors	4 × 1.5 mm²
AWG equiv. (70 mm²)	2/0 AWG
AWG equiv. (35 mm²)	2 AWG
AWG equiv. (1.5 mm²)	16 AWG
Conductor class	IEC 60228 Class 5 (fine-stranded)
Conductor material	Bare copper (uncoated)
Insulation compound	Rubber (EPR) — individual cores
Shielding (power cores)	Semi-conductive rubber screen layer
Inner bedding	Elastomeric filler with tape separation
Outer sheath compound	Elastomer (PCP/CPE equivalent) — oil-resistant
Outer diameter	≈ 48.0 mm ± 1.5 mm
Copper weight	≈ 2,410 kg/km
Total cable weight	≈ 4,140 kg/km (4.14 kg/m)
Max. operating temp.	+90 °C (conductor)
Short-circuit temp.	+250 °C (max. 5 sec)
Min. laying temp.	−25 °C (static) / −15 °C (dynamic)
Min. bending radius	≥ 12 × OD ≈ 576 mm (dynamic)

CURRENT CARRYING CAPACITY & REEL DE-RATING

OPTICAL FIBRE ELEMENT — OFE6 62.5/125 MM MULTIMODE

FIBRE OPTIC ELEMENT (OFE) SPECIFICATION

OFE6 62.5/125 — 6-FIBRE OM1 MULTIMODE, LOOSE-TUBE PROTECTED

The integrated **OFE6** (Optical Fibre Element) consists of **six multimode graded-index fibres** of 62.5/125 µm profile (OM1 per IEC 60793-2-10) contained within a loose polyethylene tube filled with hydrophobic gel. The loose-tube design provides critical mechanical isolation: the fibres float freely and are not subject to tensile strain from the surrounding power-core assembly during reeling cycles. This protects fibre integrity at all operating speeds within the specified minimum bend radius. The OFE6 enables **real-time HD video links (1000BASE-SX) and PROFINET Industrial Ethernet** between mobile machine vision systems and control room PLCs without susceptibility to electromagnetic fields from the 0.6/1 kV power conductors running parallel within the same cable.

OFE PHYSICAL & OPTICAL PARAMETERS	
Fibre type	OM1 Multimode (IEC 60793-2-10)
Core / cladding diameter	62.5 / 125 µm
Fibre count per tube	6 fibres (6G)
Fibre coating diameter	250 µm (acrylate primary)
Tube construction	Loose-tube, gel-filled (PE)
Min. bend radius (static)	25 mm
Min. bend radius (dynamic)	As cable overall: ≥ 12 × OD
Numerical aperture (NA)	0.275 ± 0.015
Attenuation @ 850 nm	≤ 3.5 dB/km
Attenuation @ 1300 nm	≤ 1.5 dB/km
Bandwidth (OFL, 850 nm)	≥ 200 MHz·km
Max. data rate	1 Gbps to 275 m (1000BASE-SX)
Colour coding	IEC 60304 / TIA 598-C standard
Operating temperature	−25 °C to +70 °C

TERMINATION & FIELD HANDLING — OFE6

Field splicing or connectorisation of the OFE within an installed composite reel cable requires a factory-prepared pigtail assembly with certified optical loss documentation. The OFE tube must

T	Torsion-resistant anti-twist lay design
O	Oil-resistant outer sheath (Class 2)
E	Protective PE tube for integrated optical fibre
U	Unarmoured (light construction) / heavy-duty rated
-J	Rheycord® (RTS) compatibility variant — approved equivalent

Suffix `OFE6 62.5/125` designates the integrated optical fibre element: 6-fibre multimode OM1 type, 62.5 µm core / 125 µm cladding, loose-tube protected, suitable for video and PROFINET links.

BASE AMPACITY — SINGLE-LAYER FREE AIR · DIN VDE 0298-4

Reference ampacity for the 70 mm² conductor at **30 °C ambient, conductor max. 90 °C, single cable in free air** is **246 A**. This is the absolute ceiling for unobstructed overhead or ground-run installation. For all reel-drum and cable drum applications, the mandatory derating factors below must be applied before selecting protective devices or sizing supply transformer secondary circuits.

REEL OPERATING DE-RATING — IEC / VDE REFERENCE (70 MM² CORE, 90 °C MAX)

Free air / single cable (reference)	246 A	× 1.00
Single-layer on reel drum	≈ 186 A	× 0.76
Double-layer on reel drum	≈ 142 A	× 0.58
Multi-layer / fully wound (3+ layers)	≈ 115 A	× 0.47

⚠ CRITICAL DESIGN REQUIREMENT — REEL WINDING STATE

Protective devices and the drum reel installation must be designed around the **worst-case winding condition**, not the free-air rating. For a fully wound multi-layer reel drum, effective ampacity may fall to **110–120 A per phase** depending on reel geometry, ambient temperature, and ventilation. Over-current protection must be thermally computed, not instantaneous overcurrent alone. Consult the final reel drum drawing before confirming cable operating current.

COPPER WEIGHT & MECHANICAL STRENGTH

Cu wt = (3 × 70 + 35 + 4 × 1.5) mm² × 9.6 = `(210 + 35 + 6) × 9.6 = 251 × 9.6 ≈ 2,410 kg/km`. Max. tensile load = 20 N/mm² × (3 × 70 + 35 + 4 × 1.5) mm² ≈ **4,200 N**. Total cable weight of 4,140 kg/km includes all rubber insulation, inner and outer sheaths, fibre tube, aramid tensile members, and the elastomeric filler compound.

CONTROL CONDUCTORS — 4 × 1.5 MM² (16 AWG)

CONTROL CORE ELECTRICAL REFERENCE	
Cross-section	1.5 mm² each (4 cores total)
Conductor class	IEC 60228 Class 5 (flexible)
DC resistance @ 20 °C	≤ 12.1 Ω/km per IEC 60228
Max. operating voltage	300/500 V (signal / control)
Max. current (single core)	≈ 16 A (IEC 60364 free air)
Core identification	Numbered (1–4) or colour-coded per IEC

Control cores within the composite structure are derated due to proximity heating from power cores. Feichun recommends conservative maximum of **6–8 A per control core** under worst-case loaded conditions on the reel drum.

be cleanly separated from the power core assembly and handled individually; **never bend the fibre tube below the specified dynamic radius during installation**. For reel-drum applications exceeding 300 m, specify pre-tested fibre links with optical loss budget validation. Connector type (LC, SC, or ST) must be agreed at time of order; standard supply is bare cleaved tube ends for field fusion splicing.

MECHANICAL & APPLICATION PROPERTIES

MECHANICAL REFERENCE DATA	
Reeling duty type	Continuous drum reel (trailing cable)
Max. travel / reel speed	120 – 180 m/min
Tensile reinforcement	Aramid (Kevlar®) braid integrated
Torsion resistance	Anti-twist lay (TS designation)
Abrasion resistance	Elastomeric sheath — Grade M per VDE
Oil resistance	Class 2 oil-resistant per VDE
Min. bending radius (dynamic)	≥ 12 × OD ≈ 576 mm
Min. bending radius (static)	≥ 5 × OD ≈ 240 mm
Flammability class	IEC 60332-1 (single vertical flame)
Sheath colour	Black (standard); orange on request

TYPICAL GANTRY & MOBILE EQUIPMENT APPLICATIONS

Container gantry cranes and rail-mounted stacker-reclaimers — where the cable must repeatedly extend and retract under torsional stress over the full reel width. **Open-pit bucket-wheel excavator and dragline systems** operating on continuous reel duty at mine sites and quarries. **Shipyard and offshore gantry cranes** requiring oil and UV resistance with marine-grade sheath durability. The aramid tensile braid permits the cable to suspend its own weight across long overhead spans while the anti-torsion lay counteracts the twisting torques generated during continuous reel winding and unwinding cycles.

APPLICABLE STANDARDS & COMPLIANCE

- `VDE 0250` — Core standard for flexible rubber-insulated cables for heavy industry; governs construction, test requirements, and marking for composite reeling cables
- `IEC 60228` — Conductor construction and resistance for Classes 5/6 fine-stranded copper
- `IEC 60502-1` — Power cables with extruded insulation, voltage rating ≤ 1 kV (control cores)
- `IEC 60793-2-10` — Multimode graded-index optical fibre (OM1, 62.5/125 µm)
- `DIN VDE 0298-4` — Permissible current carrying capacities; derating factors for grouped and reel-wound cables
- `IEC 60332-1` — Single vertical flame propagation test for insulated conductors

ORDERING INFORMATION & TECHNICAL SUPPORT

Specify the full type designation, drum length, and reel geometry at time of order. Example: `(N)SHTOEU-J 3×70+1×35+4×1.5 OFE6 · 0.6/1 kV · 200 m drum · Black elastomer sheath · Bare Cu · LC/APC pigtails (OFE)`
Custom configurations (additional control cores, alternate fibre counts, armoured SWA variant) available on OEM engineering consultation. VDE test reports and Rheycord® compatibility certificates issued at time of order. Lead time: **3–6 weeks** from approved engineering drawing.
tech@feichuncables.com | **+86 138 5512 3218** | **www.feichuncables.com**

3 × 70 mm² Power | 1 × 35 mm² Earth | 4 × 1.5 mm² Control

6G OFE 62.5/125 | Elastomer Sheath | Aramid Tensile | Anti-Torsion Lay | Oil-Resistant | 0.6/1 kV · 246 A

All data are nominal. Ampacity per DIN VDE 0298-4 at 30 °C ambient, single cable free air; apply mandatory derating for reel-drum applications (×0.76 single layer, ×0.58 double layer, ×0.47 multi-layer).
Optical fibre specifications per IEC 60793-2-10 OM1. Cable dimensions and weights subject to manufacturing tolerances of ±5%. This specification is equivalent to Nexans Rheycord® (RTS) standard.