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INDUSTRIAL CONTROL, POWER & AUTOMATION CABLE SPECIALIST · WWW.FEICHUNCABLES.COM

DOCUMENT FC-PDS-ONB-FLEX-0.6-1kV-2026-017
REVISION Rev. A1 | **DATE** 2026-02-24
CLASS Product Data Sheet | ONB FLEX 0.6/1 kV — Heavy-Duty Rubber Reeling Cable for Drum & Reel Systems
STANDARDS VDE 0298-4 | IEC 60228 Cl. 5 | HD 22.4 S4 | IEC 62893 | RoHS / REACH

PRODUCT SPECIFICATION — ONB FLEX 0.6/1 KV HEAVY-DUTY RUBBER REELING CABLE — PORT MACHINERY · MINING HOISTS · MOBILE EQUIPMENT DRUM SYSTEMS

ONB FLEX 3×2.5 (1kV) ★ | ONB FLEX 4×10 (1kV) | ONB FLEX 3×50+1×16 (1kV, High-Flex Reeling)

Three variants of the ONB FLEX heavy-duty rubber reeling cable family, rated 0.6/1 kV — equivalent to the European NSHTÖU standard (Polish designation: *Bębnowy* = drum/reel). Fine-stranded Class 5 tinned-copper conductors, oil-resistant EPR/rubber insulation and chloroprene (CR) outer sheath, with integrated anti-torsion braid, designed for millions of drum winding cycles at travel speeds to 120 m/min.
Applications: Port cranes & ship-to-shore gantries · Mining hoists & continuous miners · Mobile cable drum units on large excavators & stackers

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FC RUBBER CR SHEATH · ANTI-TORSION BRAID · 0.6/1 kV · DRUM / REEL DUTY · VDE 0298-4 · IEC 62893

★ FEICHUN CABLE SERIES

3-Variant Reeling Cable Range

Chloroprene Rubber Outer · Anti-Torsion Construction
2.5 mm² – 50 mm² · 0.6/1 kV · Up to 120 m/min

Feichun Engineering Cables · RoHS Compliant · VDE / IEC · ONB FLEX 3×2.5 ★ Highlighted

ONB FLEX 0.6/1 KV — HEAVY-DUTY RUBBER DRUM & REEL CABLE (NSHTÖU EQUIVALENT)

ONB FLEX — FAMILY OVERVIEW

CHLOROPRENE RUBBER · ANTI-TORSION · EPR INSULATION · 0.6/1 KV

The **ONB FLEX** is a heavy-duty special rubber cable rated 0.6/1 kV, designed specifically for continuous mechanical stressing on motorised cable drums, reel systems, and tow-line drives on large mobile industrial equipment. The Polish designation *ONB* derives from *Bębnowy* (drum/reel) and is functionally equivalent to the German **NSHTÖU** VDE heavy-duty rubber category. Construction features Class 5 **fine-stranded tinned-copper conductors** for fatigue resistance across millions of bending cycles, individual core insulation in ethylene-propylene rubber (EPR), a helically applied **anti-torsion braided layer** to distribute torsional stress uniformly during winding and unwinding, and a tough outer sheath in **chloroprene rubber (CR)** compounded for resistance to mineral oils, ozone, UV radiation, and moderate chemical exposure. The three variants on this sheet span the range from compact multi-circuit control cables (3×2.5 mm²) through medium distribution cables (4×10 mm²) to heavy-power reeling cables (3×50+1×16 mm²) capable of supplying large crane and mining equipment drives at full 1 kV rated voltage. All variants are suitable for travel speeds up to 120 m/min on drum systems with a minimum winding radius of 5 × outer diameter.

`0.6/1 kV rated` `CR Rubber / EPR Insulation`

ONB FLEX 3×2.5 — 0.6/1 KV REELING CABLE ★ HIGHLIGHTED

ONB FLEX 3×2.5 — 0.6/1 KV ★ HIGHLIGHTED



3×2.5 mm²
EPR ins. / CR outer
Anti-torsion braid

★ HIGHLIGHTED VARIANT

ONB FLEX 3×2.5 — CORE DATA (0.6/1 KV)	
Configuration	3 × 2.5 mm²
Voltage (U₀/U)	0.6/1 kV
AWG equivalent	≈ 14 AWG
Outer diameter range	12.6 – 16.1 mm
Copper weight	≈ 72 kg/km
Total weight (approx.)	250 – 305 kg/km
Current capacity (free air)	30 A (30 °C, VDE 0298-4)
Insulation	EPR (ethylene-prop. rubber)
Outer sheath	CR (chloroprene rubber)

ONB FLEX 4×10 & 3×50+1×16 — MEDIUM & HEAVY-POWER REELING VARIANTS

ONB FLEX 4×10 — 0.6/1 KV



4×10 mm²
EPR ins. / CR outer
Anti-torsion braid

4×10 — CORE DATA (0.6/1 KV)	
Configuration	4 × 10 mm²
AWG equivalent	≈ 8 AWG
Outer diameter range	25.5 – 27.4 mm
Copper weight	≈ 384 kg/km
Total weight (approx.)	800 – 850 kg/km
Current capacity (free air)	61 A (30 °C, VDE 0298-4)
Max. tensile force (dynamic)	≈ 600 N (≈ 61 kgf)
Min. bending radius (drum)	5 × OD ≈ 128–137 mm

APPLICATION — MEDIUM DISTRIBUTION & DRIVE POWER

The 4×10 variant is typically specified for **medium-capacity crane travel drives, conveyor power supplies, and coal-continuous-miner cable drums** where 3-phase + PE at 10 mm² provides the necessary current capacity in a single reeling cable. At 61 A free-air rating (de-rated to approximately 37 A on a three-layer drum), it comfortably supplies drive motors in the 11–22 kW range at 1 kV.

ONB FLEX 3×50+1×16 — 0.6/1 KV HIGH-FLEX REELING



3×50 + 1×16 mm²
3 phase + reduced PE
CR outer / EPR ins.

3×50+1×16 — CORE DATA (0.6/1 KV)	
Configuration	3×50 mm² + 1×16 mm² PE
AWG equivalents	1/0 AWG (main) + 6 AWG (PE)
Outer diameter range	38.5 – 42.5 mm
Copper weight	≈ 1594 kg/km
Total weight (approx.)	2850 – 2950 kg/km
Current capacity (free air)	175 A (30 °C, VDE 0298-4)
Max. tensile force (dynamic)	≈ 2490 N (≈ 254 kgf)
Min. bending radius (drum)	5 × OD ≈ 193–213 mm

ENGINEERING REFERENCE DATA — REELING DUTY DESIGN PARAMETERS

1 — AMPACITY DE-RATING FOR DRUM INSTALLATIONS (VDE 0298-4)

⚠ CRITICAL — WINDING LAYERS SEVERELY REDUCE HEAT DISSIPATION

The current-carrying capacities tabulated on this sheet are based on **30 °C ambient temperature with the cable fully deployed in free air**, per DIN VDE 0298-4. When wound on a drum, heat dissipation is sharply restricted by the surrounding rubber layers, and the effective rating must be reduced by the winding de-rating factor. The applicable factor depends on the number of wound layers simultaneously carrying current. Engineers must verify that the calculated operating current does not exceed the de-rated value at the maximum expected drum fill state.

WINDING DE-RATING FACTOR VS. AMPACITY — ONB FLEX DRUM INSTALLATION

1 layer	× 0.80
2 layers	× 0.61
3 layers	× 0.49

Example — ONB FLEX 3×50+1×16 at maximum 3-layer winding:
*175 A × 0.49 = **85.75 A** effective safe operating current. Engineers specifying this cable for drives exceeding this figure must ensure the drum is equipped with a cable-tension unwind mechanism to prevent full three-layer accumulation during steady-state operation.*

2 — MAXIMUM DYNAMIC TENSILE FORCE (15 N/MM² COPPER STRESS LIMIT)

ANTI-TORSION BRAID CARRIES PRIMARY LOAD — COPPER IS ELECTRICAL, NOT STRUCTURAL

Reeling cables incorporating an anti-torsion braid are designed so that the braided layer, not the copper conductors, carries the primary longitudinal tensile load during cable unwinding. Nevertheless, an engineering limit of **15 N/mm²** is applied to the conductor cross-section as a supplementary worst-case stress figure for dynamic operation, accounting for inertia forces at the rated reel speed. Exceeding this value risks progressive work-hardening and eventual fracture of individual strands in the fine-stranded Class 5 construction. The maximum safe dynamic tensile forces for each variant are as follows.

VARIANT	MAX. FORCE (N)	EQUIV. (KGF)
3×2.5 ★	≈ 75 N	≈ 7.6 kgf
4×10	≈ 600 N	≈ 61 kgf
3×50+1×16	≈ 2490 N	≈ 254 kgf

Max. tensile force (dynamic)	≈ 75 N (≈ 7.6 kgf)
Min. bending radius (drum)	5 × OD ≈ 63–81 mm

★ WHY ONB FLEX 3×2.5 — KEY SELECTION RATIONALE

At three cores × 2.5 mm² with a 30 A free-air rating, the ONB FLEX 3×2.5 is the primary specification for **compact cable drum units on small-to-medium cranes, hoists, and mobile machinery platforms** where a three-phase power supply — or a two-phase supply plus protective earth — must be routed via a drum system in a mechanically demanding environment. Its compact outer diameter (12.6–16.1 mm) allows use on drums with small barrel diameters and through tight guide-roller systems typical of lightweight gantry cranes, workshop jibs, and automated guided vehicle (AGV) power tethers. The CR sheath withstands the ozone, hydraulic-fluid mist, and UV loading typical of outdoor port and mine-surface environments without the surface cracking that afflicts PVC over time. The EPR insulation maintains flexibility and dielectric integrity down to −40 °C, ensuring reliable cold-start operation in unheated outdoor facilities and arctic equipment.

PE core cross-section	16 mm² (reduced, IEC 60364)

APPLICATION — HEAVY-POWER PORT & MINING EQUIPMENT

The 3×50+1×16 configuration is the standard heavy-power reeling cable for **ship-to-shore container cranes, rubber-tyred gantry (RTG) cranes, large bucket-wheel excavators, and underground mining continuous haulage systems** where drive motors in the 75–200 kW range require 3-phase supply at up to 1 kV via a mobile drum. The reduced PE core (1×16 mm² per IEC 60364-5-54) is accepted where the main conductor cross-section is 35 mm² and above. At 2490 N maximum dynamic tensile load (≈ 254 kgf), the anti-torsion braid and copper-core fatigue design are essential to maintaining electrical integrity across the full service life.

CONSOLIDATED VARIANT COMPARISON — ALL THREE PRODUCTS

TYPE	Ø (MM)	CU KG/KM	WT KG/KM	I FREE (A)	T-FORCE (N)
3×2.5 ★	12.6–16.1	72	250–305	30	75
4×10	25.5–27.4	384	800–850	61	600
3×50+1×16	38.5–42.5	1594	2850–2950	175	2490

I free = free-air ampacity at 30 °C, VDE 0298-4. T-Force = max. dynamic tensile force at 15 N/mm² conductor stress. All variants: 0.6/1 kV, CR outer sheath, EPR insulation, anti-torsion braid, Class 5 tinned Cu. ★ = highlighted variant.

Calculated as: conductor cross-section total (mm²) × 15 N/mm². For 3×50+1×16: (3×50 + 1×16) × 15 = 166 mm² × 15 = 2490 N. These values apply to dynamic (in-motion) operation; static suspended weight allowances may differ per system design.

3 — MINIMUM BENDING RADIUS & 4 — MAXIMUM TRAVEL SPEED

MIN. BENDING RADIUS: 5 × OD (DRUM) — 7.5 × OD (ROLLER GUIDE)

To maintain the full service life of the anti-torsion construction, the cable must not be bent below its minimum permissible radius. For direct winding on a drum barrel, the minimum bending radius is **5 × outer diameter**; when the cable passes over a guide pulley or deflection roller prior to the drum, the recommended minimum is **7.5 × outer diameter** to account for the combined bending and tensile stress at the roller contact point. The practical drum barrel diameters derived from these limits are tabulated below.

VARIANT	MIN. R DRUM (5×OD)	MIN. R ROLLER (7.5×OD)
3×2.5 ★	63 – 81 mm	95 – 121 mm
4×10	128 – 137 mm	191 – 206 mm
3×50+1×16	193 – 213 mm	289 – 319 mm

Calculated on nominal outer diameter range midpoint. Drum barrel diameter ≥ 2 × minimum bending radius. Verify with mechanical designer against actual drum geometry.

MAX. TRAVEL SPEED — 120 M/MIN STANDARD RATING

All three ONB FLEX variants are rated for drum travel speeds up to **120 m/min** under standard operating conditions (nominal load, rated ambient temperature). At this speed the anti-torsion braid prevents the cable from twisting or kinking as it transitions between the deployed length and the wound portion. For applications requiring travel speeds above 120 m/min — such as high-speed ship-unloader gantries — a specialist high-speed reeling cable with an enhanced anti-twist construction should be specified; contact Feichun application engineering for an appropriate recommendation.

TECHNICAL STANDARDS & CLASSIFICATIONS

- `IEC 62893 / HD 22.4 S4` — International and European standard for reeling and flexible cables; construction, testing, and marking requirements for ONB FLEX (NSHTÖU equivalent)
- `DIN VDE 0298-4` — Current-carrying capacities and de-rating factors; all tabulated ampacity values reference this standard at 30 °C, free air
- `IEC 60228 Class 5` — Fine-stranded flexible conductors; tinned copper throughout; enables the high flex-cycle life of the anti-torsion construction
- `IEC 60811 (EN 50395)` — Mechanical and thermal test methods for EPR insulation and CR outer sheath compounds; includes oil-resistance, ozone-resistance, and heat-ageing tests
- `IEC 60364-5-54` — Reduced protective earth conductor (1×16 mm²) in the 3×50+1×16 variant; applicable where main conductor cross-section ≥ 35 mm²
- RoHS 2011/65/EU & REACH — All variants listed are confirmed RoHS and REACH compliant as supplied

ONB FLEX 3×2.5 ★	0.6/1 kV CR Rubber	Anti-Torsion Braid
De-rate × 0.49 (3L)	Max 2490 N Pull	5 × OD Min Radius
120 m/min Travel	IEC 62893	RoHS Compliant

ORDERING & CONTACT

Specify with full type designation, rated voltage, and required drum length, e.g. `ONB FLEX 3×2.5 0.6/1kV, 200 m drum`, `ONB FLEX 4×10 0.6/1kV`, `ONB FLEX 3×50+1×16 0.6/1kV`. Custom cross-sections and non-standard drum lengths available on request. Minimum order quantities apply to special configurations.

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