DIN VDE 0250-814 · HEAVY RUBBER TRAILING CABLE · CRANES AND REELS | 0.6/1 kV | 13 sizes | CR rubber, low-temp | BARE COPPER | LOW-TEMPERATURE GRADE | TENSILE SUPPORT BRAID | REELING / FESTOON DUTY

# NSHTöu 3× 0.6/1 kV

Heavy Rubber Trailing Cable with Tensile Support 0.6/1 kV – 3 cores of equal cross-section in concentric layers with a short lay length. Low-temperature polychloroprene rubber sheath. Complete technical data sheet: construction, dimensions, weights, current ratings, voltage drop and installation guidance for 13 sizes.

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## 01 Application and Product Overview

NSHTöu is the heavy rubber trailing cable for cranes, reels and festoon systems that move under tension. The design follows DIN VDE 0250-814: EPR/HEPR-insulated cores of fine-wire copper are stranded with a short lay length, a rubber inner sheath carries a tensile support element and an oil-resistant polychloroprene outer sheath protects the cable. Compared with a plain NSHTöu cable the tensile support allows a permanent load of 15 N/mm² and a dynamic load of 30 N/mm² on the copper cross-section.

### Design

The cores are insulated with rubber of type 3GI3 (HEPR) for 90 °C at the conductor. Cores and protective conductors are stranded in short-lay layers; in the three-core designs with split PE the protective conductors lie in the outer interstices, so that the power cores form a compact, balanced triangle. A rubber inner sheath is extruded over the stranded core; an aramid tensile support braid bedded between the sheaths takes the axial load; the outer sheath is polychloroprene 5GM5. The construction keeps the copper free of tension, which is what extends cable life on reels and cranes.

### Typical applications

- Crane, hoist and bridge-crane trailing cables with a cable chain or festoon trolley
- Cable reels of bucket-wheel excavators, stackers, reclaimers and portal cranes
- Mobile harbour and container equipment with repeated winding and unwinding
- Mining machinery, drilling rigs and shuttle systems that carry the cable under tension
- Mobile crushing and screening plants fed from a reel or a drag-cable arrangement
- Industrial hoisting systems with long free-hanging lengths
- Tunnelling machines and transfer cars with tensile and torsional loading
- Cold-climate duty: sites, cold stores and open-cast operations where the cable is moved at temperatures down to 40 °C

| 13 sizes | 0.6/1 kV | +90 °C | CR rubber, low-temp |
|---|---|---|---|
| Cross-section 1.5 – 150 mm² | Rated voltage $U_0/U$ | Maximum conductor temperature | Sheath: CR rubber, low-temp |

### Key features

- Aramid tensile support braid: permanent load 15 N/mm², dynamic load 30 N/mm² on the copper cross-section
- HEPR insulation, 90 °C at the conductor, short-circuit temperature 250 °C
- Reeling-duty bending radii of 6 × D to 10 × D depending on diameter
- Oil-resistant polychloroprene sheath, flame-retardant to IEC 60332-1-2
- Split PE conductors in the outer interstices (3×+3E designs) for a round, compact core
- Fine-wire class 5 conductors, bare or tinned


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- 13 sizes from 1.5 to 150 mm²; weight from 219 to 6,140 kg/km; copper from 43 to 4,320 kg/km

### Core layout and conductor

3 cores of equal cross-section in concentric layers with a short lay length. Core colours: brown, black, grey (DIN VDE 0293-308); no protective core is included. The three-core layout feeds a three-phase motor without neutral; protective earth is provided separately. The conductors are bare annealed copper. Bare copper has the lowest conductor resistance of the class 5 range and is the usual choice for dry and damp indoor use. Where the cable is exposed to salt, sulphur or permanent moisture, the tinned version of the same cable is preferable.

### Standard background

DIN VDE 0250-814 describes the NSHTöu rubber trailing cable. The standard adds a tensile-bearing element to the heavy rubber-sheathed design so that the cable can be used as a trailing, reeling or festoon cable under tension. For sizes from 25 mm² the split-PE 3×+3E designs are the usual choice for crane and reel feeds.

The low-temperature grade of the sheath compound remains flexible down to 40 °C in motion and 50 °C in fixed installation, so the cable can be reeled and trailed on cold sites, in cold stores and in northern open-cast operations. The mechanical and electrical ratings are those of the standard grade; only the cold-flexing limit is extended.

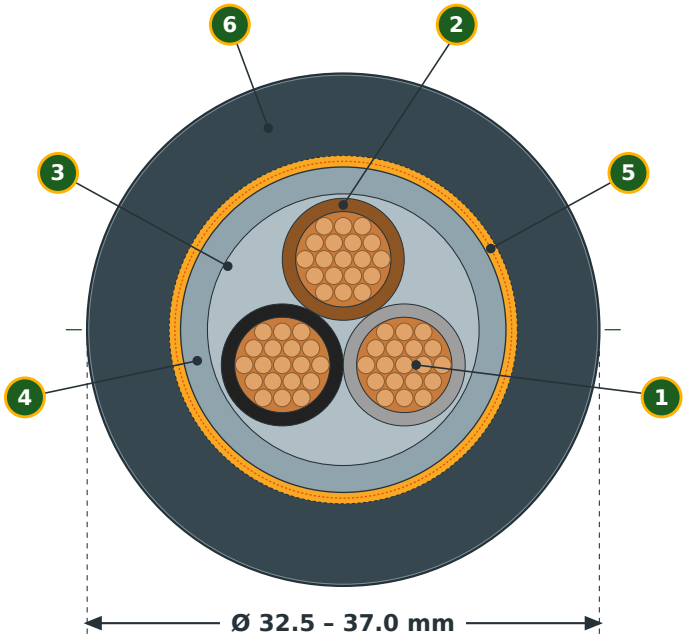
A braid of aramid yarn between the inner and the outer sheath takes the axial load that would otherwise stretch the copper. It keeps the stranded cores from lengthening, prevents loops (“bird-caging”) when the cable is released from tension on a reel and raises the permissible working load above the copper-based rating. The load must be introduced through a clamp that holds the sheath and the braid, never through the conductors.

0.6/1 kV (rated phase-to-earth / phase-to-phase voltage) covers 400 V and 690 V three-phase systems; the test voltage is 3 kV.

## 02 Construction

**FEICHUN · CROSS-SECTION A-A · 0.6/1 kV**

**NSHTöu**
Sample size 3×25 · Rev 0 · Illustrative, not to scale




| No. | Component | Material |
|---|---|---|
| 1 | Conductor | Bare annealed fine-wire copper, class 5 to IEC 60228 / DIN VDE 0295 |
| 2 | Insulation | HEPR rubber, type 3GI3 (90 °C) |
| 3 | Filler and binder tape | Rubber or compound filler with polyester binder tape |
| 4 | Inner sheath | Rubber compound, extruded over the stranded core |
| 5 | Tensile support braid | Aramid yarn braid between inner and outer sheath; carries the axial load |
| 6 | Outer sheath | Polychloroprene (CR) rubber, low-temperature grade |

The drawing shows size 3×25. Other sizes have the same construction with scaled dimensions; the layout of every size is checked for non-overlap of all elements.


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### Construction details

| | |
|---|---|
| **Conductor** | Bare annealed fine-wire copper, class 5 to DIN VDE 0295 / IEC 60228 |
| **Insulation** | HEPR rubber, type 3GI3 (90 °C), maximum conductor temperature 90 °C |
| **Core identification** | Brown, black, grey to DIN VDE 0293-308 |
| **Stranding** | Cores in concentric layers with a short lay length |
| **Inner sheath** | Rubber compound; thickness about 1.8 mm at this size |
| **Tensile support braid** | Aramid yarn braid, 0.77 mm thick, between inner and outer sheath |
| **Outer sheath** | Polychloroprene (CR) rubber, low-temperature grade; thickness about 5.5 mm at this size |

## 03 Electrical, Thermal and Mechanical Characteristics

### Electrical data

| | |
|---|---|
| **Rated voltage $U_0/U$** | 0.6/1 kV AC |
| **Test voltage** | 3 kV AC, 5 min |
| **Maximum operating voltage, three-phase** | 1.2 kV |
| **Maximum operating voltage, DC (core-earth / core-core)** | 0.9/1.8 kV |
| **Current-carrying capacity** | Design values by the method of DIN VDE 0298-4, free air, 30 °C ambient |
| **Conductor resistance** | Maximum at 20 °C, class 5, bare |

### Thermal and mechanical data

| | |
|---|---|
| **Maximum conductor temperature** | +90 °C |
| **Maximum temperature at short circuit** | +250 °C (5 s maximum) |
| **Ambient temperature, fixed installation** | −50 °C to +80 °C |
| **Ambient temperature, in motion** | −40 °C to +80 °C |
| **Minimum bending radius** | Fixed: 3 × D (D ≤ 12 mm), 4 × D (D > 12 mm); moving: 4 × D (≤ 12 mm), 5 × D (≤ 20 mm), 6 × D (> 20 mm); reeling: 6 to 10 × D |
| **Maximum tensile load** | Permanent 15 N/mm², dynamic 30 N/mm² on the total copper cross-section of the power cores (including the aramid support braid) |
| **Flame propagation** | IEC 60332-1-2 / DIN EN 60332-1-2 |
| **Halogen-free** | No (CR rubber, low-temp) |
| **Mineral oil resistance** | Resistant, DIN EN 60811-404 |
| **UV and ozone resistance** | Resistant |
| **Water** | Damp and wet areas, spray water |


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## 04 Dimensions, Weights and Rated Data – 0.6/1 kV (13 sizes)

| Type designation cores × mm² | FeiChun article no. | Cond. Ø max mm | Outer Ø min mm | Outer Ø max mm | Bend radius fixed mm | Bend radius moving mm | Weight approx. kg/km | Copper kg/km | Max. pull N | $R_{20}$ max Ω/km | Rated current A | $I_k$ (1 s) kA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **3×1.5** | FC-NSHT-0329-01 | 1.7 | 14.0 | 15.9 | 64 | 80 | 219 | 43 | 1,060 | 13.3 | 23 | 0.214 |
| **3×2.5** | FC-NSHT-0329-02 | 2.2 | 16.0 | 18.2 | 73 | 91 | 310 | 72 | 1,250 | 7.98 | 31 | 0.357 |
| **3×4** | FC-NSHT-0329-03 | 2.7 | 18.3 | 20.8 | 83 | 125 | 410 | 115 | 1,490 | 4.95 | 42 | 0.572 |
| **3×6** | FC-NSHT-0329-04 | 3.3 | 20.1 | 22.9 | 92 | 137 | 510 | 173 | 1,770 | 3.30 | 54 | 0.858 |
| **3×10** | FC-NSHT-0329-05 | 4.1 | 23.0 | 26.5 | 106 | 159 | 790 | 288 | 2,200 | 1.91 | 74 | 1.43 |
| **3×16** | FC-NSHT-0329-06 | 5.2 | 26.0 | 29.5 | 118 | 177 | 1,180 | 460 | 2,850 | 1.21 | 99 | 2.29 |
| **3×25** | FC-NSHT-0329-07 | 6.5 | 32.5 | 37.0 | 148 | 222 | 1,640 | 720 | 3,890 | 0.780 | 131 | 3.58 |
| **3×35** | FC-NSHT-0329-08 | 7.7 | 35.0 | 40.0 | 160 | 240 | 2,190 | 1,010 | 4,810 | 0.554 | 162 | 5.00 |
| **3×50** | FC-NSHT-0329-09 | 9.2 | 40.5 | 46.0 | 184 | 276 | 2,980 | 1,440 | 6,220 | 0.386 | 202 | 7.15 |
| **3×70** | FC-NSHT-0329-10 | 10.8 | 45.5 | 52.0 | 208 | 312 | 3,240 | 2,020 | 7,890 | 0.272 | 250 | 10.01 |
| **3×95** | FC-NSHT-0329-11 | 12.6 | 52.0 | 59.0 | 236 | 354 | 4,030 | 2,740 | 10,010 | 0.206 | 302 | 13.59 |
| **3×120** | FC-NSHT-0329-12 | 14.2 | 57.0 | 65.0 | 260 | 390 | 5,040 | 3,460 | 11,970 | 0.161 | 350 | 17.16 |
| **3×150** | FC-NSHT-0329-13 | 15.8 | 62.5 | 71.0 | 284 | 426 | 6,140 | 4,320 | 14,630 | 0.129 | 402 | 21.45 |

Current-carrying capacity: design values by the method of DIN VDE 0298-4, free air, 30 °C ambient; for other ambient temperatures use the factors below. Copper weight = 9.6 kg/(km·mm²) of copper cross-section (VDE copper index). Pull force = 15 N/mm² × total copper cross-section of the power cores plus the permissible load of the aramid braid. Diameters, dimensions and weights are nominal design values calibrated to published type tables; they vary within manufacturing tolerances. Confirm critical dimensions before dimensioning reels, glands or festoon systems. Other sizes and configurations are produced to order.

### Ambient temperature factors (conductor 90 °C)

| °C | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 |
|---|---|---|---|---|---|---|---|---|---|
| Factor | 1.08 | 1.04 | 1.00 | 0.96 | 0.91 | 0.87 | 0.82 | 0.76 | 0.71 |

### Short-circuit current rating

$I_k$ = 0.143 kA/mm² × cross-section of the power core (conductor 90 °C → 250 °C). For another duration t: $I_{k,t} = I_{k,1s} / \sqrt{t}$ (0.1 s ≤ t ≤ 5 s).

## 05 Tensile Load, Reeling and Festoon Data

The values below support reel and festoon design: the permitted pull split into copper and braid parts, the free-hanging length (the length at which the cable's own weight reaches the rated pull, without a safety factor), the minimum reel core diameter and an indicative winding capacity for a reel with 2,500 mm flange diameter and 1,000 mm traverse width at 90 % fill. They are not a substitute for the reel manufacturer's calculation.

| Type designation cores × mm² | Pull, copper N | Dynamic pull N | Pull, aramid braid N | Total permitted pull N | Free-hanging length m (vertical) | Min. reel core Ø mm | Winding capacity m (reel 2,500 × 1,000) |
|---|---|---|---|---|---|---|---|
| **3×1.5** | 68 | 1,127 | 992 | 1,060 | 493 | 254 | 16,775 |
| **3×2.5** | 112 | 1,363 | 1,138 | 1,250 | 411 | 292 | 12,680 |
| **3×4** | 180 | 1,670 | 1,310 | 1,490 | 370 | 416 | 9,880 |
| **3×6** | 270 | 2,040 | 1,500 | 1,770 | 353 | 458 | 7,840 |
| **3×10** | 450 | 2,650 | 1,750 | 2,200 | 283 | 530 | 5,845 |
| **3×16** | 720 | 3,570 | 2,130 | 2,850 | 246 | 590 | 4,580 |
| **3×25** | 1,120 | 5,020 | 2,770 | 3,890 | 241 | 740 | 2,795 |
| **3×35** | 1,580 | 6,380 | 3,230 | 4,810 | 223 | 800 | 2,435 |
| **3×50** | 2,250 | 8,470 | 3,970 | 6,220 | 212 | 920 | 1,720 |
| **3×70** | 3,150 | 11,040 | 4,740 | 7,890 | 248 | 1,040 | 1,330 |
| **3×95** | 4,280 | 14,280 | 5,730 | 10,010 | 253 | 1,180 | 910 |
| **3×120** | 5,400 | 17,370 | 6,570 | 11,970 | 242 | 1,300 | 720 |
| **3×150** | 6,750 | 21,380 | 7,880 | 14,630 | 242 | 1,420 | 530 |


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## 06 Voltage Drop, Losses and Short-Circuit Data

Voltage drop per 100 m of cable at rated current with the conductor at 90 °C, cos φ = 0.8 and reactance 0.08 Ω/km (three-phase). The percentage refers to a system voltage of 400 V. Loss is the total I²R loss of the loaded cores per 100 m. The short-circuit columns give the permitted current for four durations.

| Type designation cores × mm² | Rated current A | R at 90 °C Ω/km | Voltage drop V / 100 m | Voltage drop % of 400 V | Loss kW / 100 m | $I_k$ 0.1 s kA | $I_k$ 0.5 s kA | $I_k$ 1 s kA | $I_k$ 3 s kA |
|---|---|---|---|---|---|---|---|---|---|
| **3×1.5** | 23 | 17.0 | 54.24 | 13.56 | 2.69 | 0.678 | 0.303 | 0.214 | 0.124 |
| **3×2.5** | 31 | 10.2 | 43.97 | 10.99 | 2.93 | 1.13 | 0.506 | 0.357 | 0.206 |
| **3×4** | 42 | 6.31 | 37.08 | 9.27 | 3.34 | 1.81 | 0.809 | 0.572 | 0.330 |
| **3×6** | 54 | 4.21 | 31.93 | 7.98 | 3.68 | 2.71 | 1.21 | 0.858 | 0.495 |
| **3×10** | 74 | 2.44 | 25.59 | 6.40 | 4.00 | 4.52 | 2.02 | 1.43 | 0.826 |
| **3×16** | 99 | 1.54 | 21.99 | 5.50 | 4.54 | 7.24 | 3.24 | 2.29 | 1.32 |
| **3×25** | 131 | 0.995 | 19.14 | 4.79 | 5.12 | 11.31 | 5.06 | 3.58 | 2.06 |
| **3×35** | 162 | 0.706 | 17.20 | 4.30 | 5.56 | 15.83 | 7.08 | 5.00 | 2.89 |
| **3×50** | 202 | 0.492 | 15.46 | 3.86 | 6.02 | 22.61 | 10.11 | 7.15 | 4.13 |
| **3×70** | 250 | 0.347 | 14.09 | 3.52 | 6.50 | 31.65 | 14.16 | 10.01 | 5.78 |
| **3×95** | 302 | 0.263 | 13.50 | 3.38 | 7.19 | 42.96 | 19.21 | 13.59 | 7.84 |
| **3×120** | 350 | 0.205 | 12.87 | 3.22 | 7.54 | 54.26 | 24.27 | 17.16 | 9.91 |
| **3×150** | 402 | 0.164 | 12.50 | 3.13 | 7.97 | 67.83 | 30.33 | 21.45 | 12.38 |

## 07 Selection Guide and Sizing Aid

NSHTöu 3× covers 13 sizes. The smallest, 3×1.5, has an outer diameter of up to 15.9 mm and weighs about 219 kg/km; the largest, 3×150, has an outer diameter of up to 71.0 mm and weighs about 6,140 kg/km, 28.0 times as much. Across the range the rated current rises from 23 A to 402 A at 30 °C and the fixed bending radius from 64 mm to 284 mm.

**Example 1.** A circuit draws 50 A continuously at 40 °C ambient temperature, in a group of two cables. Temperature factor 0.91, grouping factor 0.80: required table current = 50 / (0.91 × 0.80) = 69 A. The smallest suitable size is 3×10 with 74 A.

**Example 2.** A circuit draws 178 A continuously at 35 °C ambient temperature, on its own. Temperature factor 0.96: required table current = 178 / (0.96) = 186 A. The smallest suitable size is 3×50 with 202 A.

## 08 Engineering Profile by Size

Every size of NSHTöu 3× with the dimensions that decide how it behaves in a circuit: layers, weight, copper share, heat, voltage drop, bending, termination and pull.

**3×1.5.** This size has with a conductor of Ø 1.7 mm under 0.70 mm of insulation (core Ø 3.1 mm) and 1.1 mm inner and 2.2 mm outer sheath; outer diameter 14.0–15.9 mm, weight about 219 kg/km of which copper 43 kg/km (20 %). Rated current 23 A at 30 °C; at that load the voltage drop is 54.24 V per 100 m (13.56 % of 400 V) and the loss 2.69 kW per 100 m. Bending radius 64 mm fixed, 80 mm moving; gland M25, lug bolt M5. Short-circuit rating 0.214 kA for 1 s; permitted pull 1,060 N, free-hanging length 493 m.

**3×2.5.** This size has with a conductor of Ø 2.1 mm under 0.70 mm of insulation (core Ø 3.5 mm) and 1.1 mm inner and 2.7 mm outer sheath; outer diameter 16.0–18.2 mm, weight about 310 kg/km of which copper 72 kg/km (23 %). Rated current 31 A at 30 °C; at that load the voltage drop is 43.97 V per 100 m (10.99 % of 400 V) and the loss 2.93 kW per 100 m. Bending radius 73 mm fixed, 91 mm moving; gland M32, lug bolt M5. Short-circuit rating 0.357 kA for 1 s; permitted pull 1,250 N, free-hanging length 411 m.

**3×4.** This size has with a conductor of Ø 2.7 mm under 0.70 mm of insulation (core Ø 4.1 mm) and 1.2 mm inner and 3.2 mm outer sheath; outer diameter 18.3–20.8 mm, weight about 410 kg/km of which copper 115 kg/km (28 %). Rated current 42 A at 30 °C; at that load the voltage drop is 37.08 V per 100 m (9.27 % of 400 V) and the loss 3.34 kW per 100 m. Bending radius 83 mm fixed, 125 mm moving; gland M32, lug bolt M5. Short-circuit rating 0.572 kA for 1 s; permitted pull 1,490 N, free-hanging length 370 m.

**3×6.** This size has with a conductor of Ø 3.3 mm under 0.70 mm of insulation (core Ø 4.7 mm) and 1.3 mm inner and 3.4 mm outer sheath; outer diameter 20.1–22.9 mm, weight about 510 kg/km of which copper 173 kg/km (34 %). Rated current 54 A at 30 °C; at that load the voltage drop is 31.93 V per 100 m (7.98 % of 400 V) and the loss 3.68 kW per 100 m. Bending radius 92 mm fixed, 137 mm moving; gland M32, lug bolt M5. Short-circuit rating 0.858 kA for 1 s; permitted pull 1,770 N, free-hanging length 353 m.


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**3×10.** This size has with a conductor of Ø 4.1 mm under 0.70 mm of insulation (core Ø 5.5 mm) and 1.4 mm inner and 4.1 mm outer sheath; outer diameter 23.0–26.5 mm, weight about 790 kg/km of which copper 288 kg/km (36 %). Rated current 74 A at 30 °C; at that load the voltage drop is 25.59 V per 100 m (6.40 % of 400 V) and the loss 4.00 kW per 100 m. Bending radius 106 mm fixed, 159 mm moving; gland M40, lug bolt M6. Short-circuit rating 1.43 kA for 1 s; permitted pull 2,200 N, free-hanging length 283 m.

**3×16.** This size has with a conductor of Ø 5.2 mm under 0.70 mm of insulation (core Ø 6.6 mm) and 1.6 mm inner and 4.2 mm outer sheath; outer diameter 26.0–29.5 mm, weight about 1,180 kg/km of which copper 460 kg/km (39 %). Rated current 99 A at 30 °C; at that load the voltage drop is 21.99 V per 100 m (5.50 % of 400 V) and the loss 4.54 kW per 100 m. Bending radius 118 mm fixed, 177 mm moving; gland M40, lug bolt M6. Short-circuit rating 2.29 kA for 1 s; permitted pull 2,850 N, free-hanging length 246 m.

**3×25.** This size has with a conductor of Ø 6.5 mm under 0.90 mm of insulation (core Ø 8.3 mm) and 1.8 mm inner and 5.5 mm outer sheath; outer diameter 32.5–37.0 mm, weight about 1,640 kg/km of which copper 720 kg/km (44 %). Rated current 131 A at 30 °C; at that load the voltage drop is 19.14 V per 100 m (4.79 % of 400 V) and the loss 5.12 kW per 100 m. Bending radius 148 mm fixed, 222 mm moving; gland M50, lug bolt M8. Short-circuit rating 3.58 kA for 1 s; permitted pull 3,890 N, free-hanging length 241 m.

**3×35.** This size has with a conductor of Ø 7.6 mm under 0.90 mm of insulation (core Ø 9.4 mm) and 2.0 mm inner and 5.5 mm outer sheath; outer diameter 35.0–40.0 mm, weight about 2,190 kg/km of which copper 1,010 kg/km (46 %). Rated current 162 A at 30 °C; at that load the voltage drop is 17.20 V per 100 m (4.30 % of 400 V) and the loss 5.56 kW per 100 m. Bending radius 160 mm fixed, 240 mm moving; gland M63, lug bolt M8. Short-circuit rating 5.00 kA for 1 s; permitted pull 4,810 N, free-hanging length 223 m.

**3×50.** This size has with a conductor of Ø 9.1 mm under 1.00 mm of insulation (core Ø 11.1 mm) and 2.2 mm inner and 6.2 mm outer sheath; outer diameter 40.5–46.0 mm, weight about 2,980 kg/km of which copper 1,440 kg/km (48 %). Rated current 202 A at 30 °C; at that load the voltage drop is 15.46 V per 100 m (3.86 % of 400 V) and the loss 6.02 kW per 100 m. Bending radius 184 mm fixed, 276 mm moving; gland M75, lug bolt M10. Short-circuit rating 7.15 kA for 1 s; permitted pull 6,220 N, free-hanging length 212 m.

**3×70.** This size has with a conductor of Ø 10.8 mm under 1.00 mm of insulation (core Ø 12.8 mm) and 2.5 mm inner and 6.9 mm outer sheath; outer diameter 45.5–52.0 mm, weight about 3,240 kg/km of which copper 2,020 kg/km (62 %). Rated current 250 A at 30 °C; at that load the voltage drop is 14.09 V per 100 m (3.52 % of 400 V) and the loss 6.50 kW per 100 m. Bending radius 208 mm fixed, 312 mm moving; gland M75, lug bolt M10. Short-circuit rating 10.01 kA for 1 s; permitted pull 7,890 N, free-hanging length 248 m.

**3×95.** This size has with a conductor of Ø 12.6 mm under 1.10 mm of insulation (core Ø 14.8 mm) and 2.8 mm inner and 7.8 mm outer sheath; outer diameter 52.0–59.0 mm, weight about 4,030 kg/km of which copper 2,740 kg/km (68 %). Rated current 302 A at 30 °C; at that load the voltage drop is 13.50 V per 100 m (3.38 % of 400 V) and the loss 7.19 kW per 100 m. Bending radius 236 mm fixed, 354 mm moving; gland M85, lug bolt M12. Short-circuit rating 13.59 kA for 1 s; permitted pull 10,010 N, free-hanging length 253 m.

**3×120.** This size has with a conductor of Ø 14.1 mm under 1.10 mm of insulation (core Ø 16.3 mm) and 3.0 mm inner and 8.7 mm outer sheath; outer diameter 57.0–65.0 mm, weight about 5,040 kg/km of which copper 3,460 kg/km (69 %). Rated current 350 A at 30 °C; at that load the voltage drop is 12.87 V per 100 m (3.22 % of 400 V) and the loss 7.54 kW per 100 m. Bending radius 260 mm fixed, 390 mm moving; gland M90, lug bolt M12. Short-circuit rating 17.16 kA for 1 s; permitted pull 11,970 N, free-hanging length 242 m.

**3×150.** This size has with a conductor of Ø 15.8 mm under 1.40 mm of insulation (core Ø 18.6 mm) and 3.3 mm inner and 8.6 mm outer sheath; outer diameter 62.5–71.0 mm, weight about 6,140 kg/km of which copper 4,320 kg/km (70 %). Rated current 402 A at 30 °C; at that load the voltage drop is 12.50 V per 100 m (3.13 % of 400 V) and the loss 7.97 kW per 100 m. Bending radius 284 mm fixed, 426 mm moving; gland M90, lug bolt M12. Short-circuit rating 21.45 kA for 1 s; permitted pull 14,630 N, free-hanging length 242 m.

Averaged over all sizes copper makes up 59 % of the cable weight; the share rises from 20 % at 3×1.5 to 70 % at 3×150, which is why the larger sizes are costed mostly on the copper market price.


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## 09 Construction Dimensions by Size

Wall thicknesses and diameters of the layers at each size, taken from the validated cross-section layout; the overall diameter in section 04 is the sum of these layers within tolerance. The insulation wall follows the voltage class 0.6/1 kV.

| Type designation cores × mm² | Conductor Ø mm | Core Ø over insulation, mm | Insulation wall mm | Laid-up core Ø mm | Inner sheath mm | Outer sheath mm | Screen + braid mm | Sheath share of Ø, % |
|---|---|---|---|---|---|---|---|---|
| **3×1.5** | 1.65 | 3.05 | 0.70 | 7.2 | 1.08 | 2.18 | 0.64 | 52 |
| **3×2.5** | 2.13 | 3.53 | 0.70 | 8.2 | 1.14 | 2.66 | 0.65 | 52 |
| **3×4** | 2.70 | 4.10 | 0.70 | 9.4 | 1.23 | 3.18 | 0.66 | 52 |
| **3×6** | 3.30 | 4.70 | 0.70 | 10.7 | 1.31 | 3.40 | 0.68 | 50 |
| **3×10** | 4.08 | 5.48 | 0.70 | 12.4 | 1.42 | 4.07 | 0.70 | 50 |
| **3×16** | 5.16 | 6.56 | 0.70 | 14.7 | 1.58 | 4.21 | 0.73 | 47 |
| **3×25** | 6.45 | 8.25 | 0.90 | 18.4 | 1.82 | 5.55 | 0.77 | 47 |
| **3×35** | 7.63 | 9.43 | 0.90 | 20.9 | 1.99 | 5.54 | 0.80 | 44 |
| **3×50** | 9.12 | 11.12 | 1.00 | 24.6 | 2.23 | 6.17 | 0.84 | 43 |
| **3×70** | 10.79 | 12.79 | 1.00 | 28.2 | 2.47 | 6.92 | 0.89 | 42 |
| **3×95** | 12.57 | 14.77 | 1.10 | 32.4 | 2.75 | 7.78 | 0.94 | 41 |
| **3×120** | 14.13 | 16.33 | 1.10 | 35.8 | 2.97 | 8.69 | 0.98 | 41 |
| **3×150** | 15.80 | 18.60 | 1.40 | 40.7 | 3.30 | 8.61 | 1.04 | 39 |

## 10 Termination Planning (indicative)

| Type designation cores × mm² | Outer Ø or W × H mm | Cable gland thread | Lug / ferrule bolt | Strip length mm | Straight length behind gland, mm |
|---|---|---|---|---|---|
| **3×1.5** | 15.9 | M25 | M5 | 10 | 30 |
| **3×2.5** | 18.2 | M32 | M5 | 10 | 35 |
| **3×4** | 20.8 | M32 | M5 | 10 | 40 |
| **3×6** | 22.9 | M32 | M5 | 11 | 45 |
| **3×10** | 26.5 | M40 | M6 | 11 | 55 |
| **3×16** | 29.5 | M40 | M6 | 12 | 60 |
| **3×25** | 37.0 | M50 | M8 | 14 | 75 |
| **3×35** | 40.0 | M63 | M8 | 16 | 80 |
| **3×50** | 46.0 | M75 | M10 | 19 | 90 |
| **3×70** | 52.0 | M75 | M10 | 26 | 105 |
| **3×95** | 59.0 | M85 | M12 | 31 | 120 |
| **3×120** | 65.0 | M90 | M12 | 35 | 130 |
| **3×150** | 71.0 | M90 | M12 | 41 | 140 |

Gland threads, lug bolts and strip lengths are planning guides computed from the dimensions above; confirm them with the accessory manufacturer.


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## 11 Comparison with Related Variants at Size 3×25

| Variant | Differs in | Outer Ø / H mm | Weight kg/km | Pull N | Current A |
|---|---|---|---|---|---|
| **This datasheet** NSHTöu 3× 0.6/1 kV | – | 37.0 | 1,640 | 3,890 | 131 |
| NSHTöu 3G 0.6/1 kV 3G25 | core configuration | 37.0 (+0%) | 1,640 (+0%) | 3,890 (+0%) | 131 (+0%) |
| NSHTöu 4× 0.6/1 kV 4×25 | core configuration | 41.0 (+11%) | 2,120 (+29%) | 4,660 (+20%) | 111 (-15%) |
| NSHTöu 3× 0.6/1 kV 3×25 | tinned vs bare copper | 37.0 (+0%) | 1,640 (+0%) | 3,890 (+0%) | 130 (-1%) |
| NSHTöu 3× 0.6/1 kV 3×25 | low-temperature sheath | 37.0 (+0%) | 1,640 (+0%) | 3,890 (+0%) | 131 (+0%) |
| NSHTöu 3× 0.66/1.14 kV 3×25 | voltage class | 38.5 (+4%) | 1,720 (+5%) | 4,040 (+4%) | 131 (+0%) |
| NSHTöu 4G 0.6/1 kV 4G25 | core configuration | 41.0 (+11%) | 2,120 (+29%) | 4,660 (+20%) | 131 (+0%) |
| NSHTöu 5× 0.6/1 kV 5×25 | core configuration | 45.0 (+22%) | 2,590 (+58%) | 5,500 (+41%) | 98 (-25%) |
| NSHTöu 5G 0.6/1 kV 5G25 | core configuration | 45.0 (+22%) | 2,590 (+58%) | 5,500 (+41%) | 111 (-15%) |

Percentages show the change against this datasheet; where a variant does not offer the exact size, the nearest listed size is used.

## 12 Standards and Testing

| Standard | Scope |
|---|---|
| **DIN VDE 0250-814** | Rubber-insulated flexible cable NSHTöu, 0.6/1 kV |
| **DIN VDE 0295 / IEC 60228** | Conductors, class 5 |
| **DIN VDE 0207-20 / -21** | Rubber insulation and sheath compounds |
| **DIN VDE 0293-308** | Core identification |
| **DIN VDE 0298-3 / -4** | Application: bending, tensile load; current-carrying capacity |
| **DIN EN 60332-1-2 / IEC 60332-1-2** | Flame propagation, single cable |

### Routine and type tests

- AC voltage test on every drum length (routine test): 3 kV, 5 min
- Conductor resistance and checks of dimensions, insulation thickness and sheath thickness
- Continuity of conductors
- Flame propagation test (IEC 60332-1-2) and mineral-oil resistance on type-test samples
- Tensile test of the finished cable and inspection of the aramid braid coverage (type test)
- Bending and torsion tests for reeling duty (type test)

**Test documentation:** every delivery is accompanied by a test certificate from FeiChun’s own laboratory. Third-party witnessed tests can be arranged at the buyer’s cost.

The design follows DIN VDE 0250-814. This datasheet does not claim the VDE approval mark; mark or approval certificates, where required for a project, are arranged on request and apply only to the type tested.


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## 13 Installation, Marking and Delivery

### Installation guidance

- Introduce the pulling or hanging load only through a strain-relief clamp or cable grip that holds the sheath and the aramid braid.
- Respect the dynamic limit of 30 N/mm² on the copper cross-section; the permanent limit is 15 N/mm².
- On a reel use a core diameter of at least 2 × the reel bending radius in the table and guide the cable without cross-over.
- Limit torsion by guiding the cable straight; release twist before re-spooling.
- Fit protective sleeves at the entry to the reel or trolley to avoid sheath wear.
- Terminate the protective conductors at both ends.

### Sheath marking

```
FEICHUN NSHTöu [cross-section] 0.6/1 kV [year] [serial no.] [metre mark]
```

### Packing and delivery

| | |
|---|---|
| **Drum** | Steel or fumigated wooden drums; cable ends sealed with heat-shrink caps |
| **Delivery length** | As ordered, in one continuous length without joints |
| **Lead time** | 2–3 weeks after technical approval |
| **Warranty** | At least 3 years against manufacturing defects |
| **Drum label** | Type, cross-section, length, gross/net weight, batch no., drum no. |

### Ordering information

**Order example: NSHTöu 3×25 0.6/1 kV** – 500 m on one drum. When requesting a quotation, state the cable type, configuration, cross-section, voltage, conductor (bare copper), length per piece, required standards and installation conditions.

## 14 Certification and Quality

All cable is subject to FeiChun's quality control, with routine testing over 100 % of the delivered length. Declarations of conformity, type-test reports and third-party tests (for example for a mine, a tunnel or a rail project) are provided per project requirement; copies of the records are available on request. FeiChun holds CE, EAC and UKCA documentation for certain product groups. Whether a certificate covers this specific construction must be confirmed with FeiChun before it is quoted in a tender.

VDE, mine-specific (for example coal-mine safety marks, MSHA) and ATEX / IECEx approvals are not implied by this datasheet. They depend on the project, the machine and the country and are arranged with the end user.

## 15 Related Datasheets and Frequently Asked Questions

Variants of this cable with a different configuration, conductor, temperature grade, screen or voltage. All datasheets are PDF files.

- NSHTöu 3G 0.6/1 kV – core configuration, CR rubber, low-temp
- NSHTöu 4× 0.6/1 kV – core configuration, CR rubber, low-temp
- NSHTöu 3× 0.6/1 kV – tinned vs bare copper, CR rubber, low-temp, tinned
- NSHTöu 3× 0.6/1 kV – low-temperature sheath, CR rubber
- NSHTöu 3× 0.66/1.14 kV – voltage class, CR rubber, low-temp
- NSHTöu 4G 0.6/1 kV – core configuration, CR rubber, low-temp
- NSHTöu 5× 0.6/1 kV – core configuration, CR rubber, low-temp
- NSHTöu 5G 0.6/1 kV – core configuration, CR rubber, low-temp

Overview of all NSHTöu datasheets: NSHTöu Heavy Rubber Trailing Cables

### Frequently asked questions

**What does the T in NSHTöu stand for?**
The T marks the tensile-bearing element of the trailing cable. In this datasheet it is realised as an aramid support braid between the inner and outer sheath.

**What tensile load can the cable carry?**
At the largest size, 3×150, the permitted pull is 14,630 N (15 N/mm² of the copper cross-section, plus the aramid braid).

**What sizes are available for NSHTöu 3×?**
13 sizes from 1.5 to 150 mm². The outer dimension of the largest size, 3×150, is 71.0 mm and the weight is about 6,140 kg/km.


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**What current can 3×25 carry?**
131 A in free air at 30 °C ambient, with the conductor at 90 °C. Other temperatures and grouping change the value; use the factors in section 04.

## 16 Trademark Notice and Intellectual Property

Cable type designations such as NSHTöu are standardised, descriptive designations defined in DIN VDE and EN standards; they are used to state which standard this product is designed to. References to other manufacturers' trade names, where made, serve only for technical comparison; FeiChun Cables is not affiliated with them.

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