DIN VDE 0250-602 · SINGLE-CORE RUBBER CABLE | 1.8/3 kV | 15 sizes | CR rubber, low-temp | TINNED COPPER | LOW-TEMPERATURE GRADE

NSGAFöu 1.8/3 kV

Special Rubber-Insulated Single-Core Cable 1.8/3 kV – A single round core with a class 5 copper conductor, insulation and sheath. Low-temperature polychloroprene rubber sheath. Complete technical data sheet: construction, dimensions, weights, current ratings, voltage drop and installation guidance for 15 sizes.

Document no. FC-TDS-VDE-2026-0426-EN · Revision 0 · Issued 2 November 2026 · Language: English

01 Application and Product Overview

NSGAFöu is a special rubber-insulated single-core cable to DIN VDE 0250-602. A fine-wire copper conductor is covered with EPR insulation and a robust polychloroprene sheath; the cable is flexible, oil-resistant and short-circuit proof, and it is installed in rail vehicles, buses and in switchgear where individual cores are routed separately. In three-phase circuits the single-core cables of one circuit are laid together.

Design

A single class 5 copper conductor carries an EPR insulation of type 3GI3 and a sheath of polychloroprene 5GM5, applied so that the finished cable is round and easy to strip. The insulation wall is dimensioned for the rated voltage of the version; higher voltage classes have a visibly thicker insulation. The screened version (NSGAFCöu) adds a concentric copper-wire braid under the sheath. Because the cable has a single core, the current carrying capacity is not reduced by neighbouring loaded cores.

Typical applications

- Main power connections in rail vehicles, trams and buses
- Short-circuit-proof connections in switchgear and distribution boards
- Converter, rectifier and transformer connections of industrial drives
- DC links and battery connections of electric vehicles and mining trucks
- Bonding and earthing connections that need a flexible, insulated conductor
- Welding-machine and furnace connections that are exposed to heat and oil
- Single-phase supply of mobile machinery where each phase is wired separately
- Cold-climate duty: sites, cold stores and open-cast operations where the cable is moved at temperatures down to 40 °C

15 sizes	1.8/3 kV	+90 °C	CR rubber, low-temp
Cross-section 4 – 400 mm²	Rated voltage U_0/U	Maximum conductor temperature	Sheath: CR rubber, low-temp

Key features

- Single-core design: no derating by adjacent loaded cores
- EPR insulation, 90 °C at the conductor, short-circuit temperature 250 °C
- Oil-resistant and flame-retardant polychloroprene sheath
- Insulation wall matched to the voltage class: 1.8/3 kV
- Fine-wire class 5 conductor for flexible routing
- Optional concentric copper braid (C version) for EMC-critical drive circuits
- 15 sizes from 4 to 400 mm²; weight from 153 to 4,560 kg/km; copper from 38 to 3,840 kg/km

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Core layout and conductor

A single round core with a class 5 copper conductor, insulation and sheath. In a three-phase circuit the three single-core cables are laid together. The conductors are tinned: each copper wire carries a thin tin coating. Tinning protects the copper against oxidation and corrosion in damp, salty or sulphurous atmospheres and keeps the conductor solderable, which is an advantage in outdoor, marine and mining installations. The resistance limits of tinned class 5 conductors are marginally higher than for bare copper; the R_{20} column shows the tinned values.

Standard background

DIN VDE 0250-602 covers rubber-insulated single-core cables of special design for flexible use in vehicles and installations. It is the reference for the NSGAFöu cable in the voltage classes 0.6/1 kV, 1.8/3 kV and 3.6/6 kV.

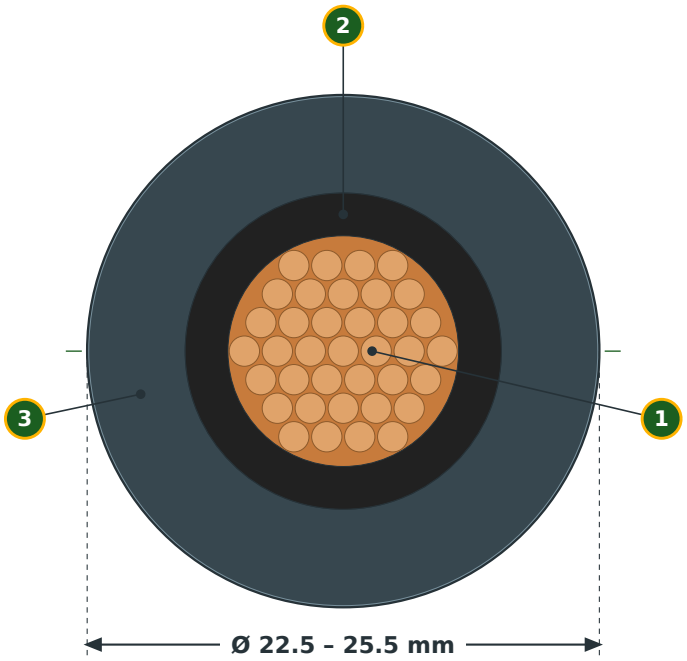
The low-temperature grade of the sheath compound remains flexible down to 40 °C in motion and 50 °C in fixed installation, so the cable can be reeled and trailed on cold sites, in cold stores and in northern open-cast operations. The mechanical and electrical ratings are those of the standard grade;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

1.8/3 kV suits 3 kV systems. The insulation wall is 2.0 mm, and the test voltage is 4.5 kV.

02 Construction

FEICHUN · CROSS-SECTION A–A · 1.8/3 kV

NSGAFöu
Sample size 1×70 · Rev 0 · Illustrative, not to scale



No.	Component	Material
1	Conductor	Tinned annealed fine-wire copper, class 5 to IEC 60228 / DIN VDE 0295
2	Insulation	EPR rubber, type 3GI3 (90 °C)
3	Outer sheath	Polychloroprene (CR) rubber, low-temperature grade

The drawing shows size 1×70. Other sizes have the same construction with scaled dimensions; the layout of every size is checked for non-overlap of all elements.

Construction details

Conductor	Tinned annealed fine-wire copper, class 5 to DIN VDE 0295 / IEC 60228
Insulation	EPR rubber, type 3GI3 (90 °C), maximum conductor temperature 90 °C
Core identification	Black to DIN VDE 0293-308
Stranding	Single core
Outer sheath	Polychloroprene (CR) rubber, low-temperature grade; thickness about 4.6 mm at this size

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03 Electrical, Thermal and Mechanical Characteristics

Electrical data

Rated voltage U_0/U	1.8/3 kV AC
Test voltage	4.5 kV AC, 5 min
Maximum operating voltage, three-phase	3.6 kV
Maximum operating voltage, DC (core-earth / core-core)	2.7/5.4 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, tinned

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: 3 × D (D ≤ 8 mm), 4 × D (D ≤ 12 mm), 5 × D (D > 12 mm) (DIN VDE 0298-3)
Maximum tensile load	15 N/mm² continuous on the total copper cross-section
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

04 Dimensions, Weights and Rated Data – 1.8/3 kV (15 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
1×4	FC-NSGA-0426-01	2.7	11.5	13.1	52	66	153	38	60	5.09	41	0.572
1×6	FC-NSGA-0426-02	3.3	12.3	14.0	56	70	184	58	90	3.39	53	0.858
1×10	FC-NSGA-0426-03	4.1	13.7	15.6	62	78	268	96	150	1.95	73	1.43
1×16	FC-NSGA-0426-04	5.2	14.8	16.8	67	84	385	154	240	1.24	98	2.29
1×25	FC-NSGA-0426-05	6.5	17.2	19.5	78	98	490	240	375	0.795	130	3.58
1×35	FC-NSGA-0426-06	7.7	18.2	20.7	83	104	640	336	520	0.565	160	5.00
1×50	FC-NSGA-0426-07	9.2	20.2	22.9	92	114	850	480	750	0.393	200	7.15
1×70	FC-NSGA-0426-08	10.8	22.5	25.5	102	128	950	670	1,050	0.277	247	10.01
1×95	FC-NSGA-0426-09	12.6	25.0	28.0	112	140	1,210	910	1,420	0.210	299	13.59
1×120	FC-NSGA-0426-10	14.2	27.0	31.0	124	155	1,500	1,150	1,800	0.164	346	17.16
1×150	FC-NSGA-0426-11	15.8	28.5	32.5	130	162	1,810	1,440	2,250	0.132	398	21.45
1×185	FC-NSGA-0426-12	17.6	31.5	36.0	144	180	2,230	1,780	2,780	0.108	454	26.45
1×240	FC-NSGA-0426-13	20.0	34.0	38.5	154	192	2,810	2,300	3,600	0.0817	534	34.32
1×300	FC-NSGA-0426-14	22.4	37.0	42.0	168	210	3,470	2,880	4,500	0.0654	614	42.90
1×400	FC-NSGA-0426-15	25.8	41.5	47.5	190	238	4,560	3,840	6,000	0.0495	736	57.20

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. 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.

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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 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 (single-phase AC, round trip). The percentage refers to a system voltage of 3,000 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 3,000 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
1×4	41	6.49	42.97	1.43	2.18	1.81	0.809	0.572	0.330
1×6	53	4.32	37.16	1.24	2.43	2.71	1.21	0.858	0.495
1×10	73	2.49	29.74	0.99	2.65	4.52	2.02	1.43	0.826
1×16	98	1.58	25.73	0.86	3.04	7.24	3.24	2.29	1.32
1×25	130	1.01	22.33	0.74	3.43	11.31	5.06	3.58	2.06
1×35	160	0.720	19.98	0.67	3.69	15.83	7.08	5.00	2.89
1×50	200	0.501	17.96	0.60	4.01	22.61	10.11	7.15	4.13
1×70	247	0.353	16.33	0.54	4.31	31.65	14.16	10.01	5.78
1×95	299	0.268	15.68	0.52	4.79	42.96	19.21	13.59	7.84
1×120	346	0.209	14.90	0.50	5.01	54.26	24.27	17.16	9.91
1×150	398	0.168	14.54	0.48	5.33	67.83	30.33	21.45	12.38
1×185	454	0.138	14.36	0.48	5.68	83.66	37.41	26.45	15.27
1×240	534	0.104	14.03	0.47	5.94	108.53	48.54	34.32	19.81
1×300	614	0.0834	14.09	0.47	6.29	135.66	60.67	42.90	24.77
1×400	736	0.0631	14.50	0.48	6.84	180.88	80.89	57.20	33.02

06 Selection Guide and Sizing Aid

NSGAFöu covers 15 sizes. The smallest, 1×4, has an outer diameter of up to 13.1 mm and weighs about 153 kg/km; the largest, 1×400, has an outer diameter of up to 47.5 mm and weighs about 4,560 kg/km, 29.8 times as much. Across the range the rated current rises from 41 A to 736 A at 30 °C and the fixed bending radius from 52 mm to 190 mm.

Example 1. A circuit draws 107 A continuously at 40 °C ambient temperature, in a group of two cables. Temperature factor 0.91, grouping factor 0.80: required table current = 107 / (0.91 × 0.80) = 147 A. The smallest suitable size is 1×35 with 160 A.

Example 2. A circuit draws 351 A continuously at 35 °C ambient temperature, on its own. Temperature factor 0.96: required table current = 351 / (0.96) = 367 A. The smallest suitable size is 1×150 with 398 A.

07 Engineering Profile by Size

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

1×4. This size has with a conductor of Ø 2.7 mm under 2.00 mm of insulation (core Ø 6.7 mm) and an outer sheath of 2.8 mm; outer diameter 11.5–13.1 mm, weight about 153 kg/km of which copper 38 kg/km (25 %). Rated current 41 A at 30 °C; at that load the voltage drop is 42.97 V per 100 m (1.43 % of 3,000 V) and the loss 2.18 kW per 100 m. Bending radius 52 mm fixed, 66 mm moving; gland M25, lug bolt M5. Short-circuit rating 0.572 kA for 1 s; permitted pull 60 N, free-hanging length 39 m.

1×6. This size has with a conductor of Ø 3.3 mm under 2.00 mm of insulation (core Ø 7.3 mm) and an outer sheath of 2.9 mm; outer diameter 12.3–14.0 mm, weight about 184 kg/km of which copper 58 kg/km (32 %). Rated current 53 A at 30 °C; at that load the voltage drop is 37.16 V per 100 m (1.24 % of 3,000 V) and the loss 2.43 kW per 100 m. Bending radius 56 mm fixed, 70 mm moving; gland M25, lug bolt M5. Short-circuit rating 0.858 kA for 1 s; permitted pull 90 N, free-hanging length 49 m.

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1×10. This size has with a conductor of Ø 4.1 mm under 2.00 mm of insulation (core Ø 8.1 mm) and an outer sheath of 3.3 mm; outer diameter 13.7–15.6 mm, weight about 268 kg/km of which copper 96 kg/km (36 %). Rated current 73 A at 30 °C; at that load the voltage drop is 29.74 V per 100 m (0.99 % of 3,000 V) and the loss 2.65 kW per 100 m. Bending radius 62 mm fixed, 78 mm moving; gland M25, lug bolt M6. Short-circuit rating 1.43 kA for 1 s; permitted pull 150 N, free-hanging length 57 m.

1×16. This size has with a conductor of Ø 5.2 mm under 2.00 mm of insulation (core Ø 9.2 mm) and an outer sheath of 3.3 mm; outer diameter 14.8–16.8 mm, weight about 385 kg/km of which copper 154 kg/km (40 %). Rated current 98 A at 30 °C; at that load the voltage drop is 25.73 V per 100 m (0.86 % of 3,000 V) and the loss 3.04 kW per 100 m. Bending radius 67 mm fixed, 84 mm moving; gland M25, lug bolt M6. Short-circuit rating 2.29 kA for 1 s; permitted pull 240 N, free-hanging length 63 m.

1×25. This size has with a conductor of Ø 6.5 mm under 2.00 mm of insulation (core Ø 10.5 mm) and an outer sheath of 3.9 mm; outer diameter 17.2–19.5 mm, weight about 490 kg/km of which copper 240 kg/km (49 %). Rated current 130 A at 30 °C; at that load the voltage drop is 22.33 V per 100 m (0.74 % of 3,000 V) and the loss 3.43 kW per 100 m. Bending radius 78 mm fixed, 98 mm moving; gland M32, lug bolt M8. Short-circuit rating 3.58 kA for 1 s; permitted pull 375 N, free-hanging length 78 m.

1×35. This size has with a conductor of Ø 7.6 mm under 2.00 mm of insulation (core Ø 11.6 mm) and an outer sheath of 3.9 mm; outer diameter 18.2–20.7 mm, weight about 640 kg/km of which copper 336 kg/km (52 %). Rated current 160 A at 30 °C; at that load the voltage drop is 19.98 V per 100 m (0.67 % of 3,000 V) and the loss 3.69 kW per 100 m. Bending radius 83 mm fixed, 104 mm moving; gland M32, lug bolt M8. Short-circuit rating 5.00 kA for 1 s; permitted pull 520 N, free-hanging length 82 m.

1×50. This size has with a conductor of Ø 9.1 mm under 2.00 mm of insulation (core Ø 13.1 mm) and an outer sheath of 4.2 mm; outer diameter 20.2–22.9 mm, weight about 850 kg/km of which copper 480 kg/km (56 %). Rated current 200 A at 30 °C; at that load the voltage drop is 17.96 V per 100 m (0.60 % of 3,000 V) and the loss 4.01 kW per 100 m. Bending radius 92 mm fixed, 114 mm moving; gland M32, lug bolt M10. Short-circuit rating 7.15 kA for 1 s; permitted pull 750 N, free-hanging length 89 m.

1×70. This size has with a conductor of Ø 10.8 mm under 2.00 mm of insulation (core Ø 14.8 mm) and an outer sheath of 4.6 mm; outer diameter 22.5–25.5 mm, weight about 950 kg/km of which copper 670 kg/km (71 %). Rated current 247 A at 30 °C; at that load the voltage drop is 16.33 V per 100 m (0.54 % of 3,000 V) and the loss 4.31 kW per 100 m. Bending radius 102 mm fixed, 128 mm moving; gland M40, lug bolt M10. Short-circuit rating 10.01 kA for 1 s; permitted pull 1,050 N, free-hanging length 112 m.

1×95. This size has with a conductor of Ø 12.6 mm under 2.00 mm of insulation (core Ø 16.6 mm) and an outer sheath of 5.0 mm; outer diameter 25.0–28.0 mm, weight about 1,210 kg/km of which copper 910 kg/km (75 %). Rated current 299 A at 30 °C; at that load the voltage drop is 15.68 V per 100 m (0.52 % of 3,000 V) and the loss 4.79 kW per 100 m. Bending radius 112 mm fixed, 140 mm moving; gland M40, lug bolt M12. Short-circuit rating 13.59 kA for 1 s; permitted pull 1,420 N, free-hanging length 119 m.

1×120. This size has with a conductor of Ø 14.1 mm under 2.00 mm of insulation (core Ø 18.1 mm) and an outer sheath of 5.4 mm; outer diameter 27.0–31.0 mm, weight about 1,500 kg/km of which copper 1,150 kg/km (77 %). Rated current 346 A at 30 °C; at that load the voltage drop is 14.90 V per 100 m (0.50 % of 3,000 V) and the loss 5.01 kW per 100 m. Bending radius 124 mm fixed, 155 mm moving; gland M40, lug bolt M12. Short-circuit rating 17.16 kA for 1 s; permitted pull 1,800 N, free-hanging length 122 m.

1×150. This size has with a conductor of Ø 15.8 mm under 2.00 mm of insulation (core Ø 19.8 mm) and an outer sheath of 5.3 mm; outer diameter 28.5–32.5 mm, weight about 1,810 kg/km of which copper 1,440 kg/km (80 %). Rated current 398 A at 30 °C; at that load the voltage drop is 14.54 V per 100 m (0.48 % of 3,000 V) and the loss 5.33 kW per 100 m. Bending radius 130 mm fixed, 162 mm moving; gland M50, lug bolt M12. Short-circuit rating 21.45 kA for 1 s; permitted pull 2,250 N, free-hanging length 126 m.

1×185. This size has with a conductor of Ø 17.5 mm under 2.00 mm of insulation (core Ø 21.5 mm) and an outer sheath of 6.1 mm; outer diameter 31.5–36.0 mm, weight about 2,230 kg/km of which copper 1,780 kg/km (80 %). Rated current 454 A at 30 °C; at that load the voltage drop is 14.36 V per 100 m (0.48 % of 3,000 V) and the loss 5.68 kW per 100 m. Bending radius 144 mm fixed, 180 mm moving; gland M50, lug bolt M16. Short-circuit rating 26.45 kA for 1 s; permitted pull 2,780 N, free-hanging length 127 m.

1×240. This size has with a conductor of Ø 20.0 mm under 2.00 mm of insulation (core Ø 24.0 mm) and an outer sheath of 6.2 mm; outer diameter 34.0–38.5 mm, weight about 2,810 kg/km of which copper 2,300 kg/km (82 %). Rated current 534 A at 30 °C; at that load the voltage drop is 14.03 V per 100 m (0.47 % of 3,000 V) and the loss 5.94 kW per 100 m. Bending radius 154 mm fixed, 192 mm moving; gland M63, lug bolt M16. Short-circuit rating 34.32 kA for 1 s; permitted pull 3,600 N, free-hanging length 130 m.

1×300. This size has with a conductor of Ø 22.3 mm under 2.00 mm of insulation (core Ø 26.3 mm) and an outer sheath of 6.6 mm; outer diameter 37.0–42.0 mm, weight about 3,470 kg/km of which copper 2,880 kg/km (83 %). Rated current 614 A at 30 °C; at that load the voltage drop is 14.09 V per 100 m (0.47 % of 3,000 V) and the loss 6.29

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kW per 100 m. Bending radius 168 mm fixed, 210 mm moving; gland M63, lug bolt M16. Short-circuit rating 42.90 kA for 1 s; permitted pull 4,500 N, free-hanging length 132 m.

1×400. This size has with a conductor of Ø 25.8 mm under 2.00 mm of insulation (core Ø 29.8 mm) and an outer sheath of 7.3 mm; outer diameter 41.5–47.5 mm, weight about 4,560 kg/km of which copper 3,840 kg/km (84 %). Rated current 736 A at 30 °C; at that load the voltage drop is 14.50 V per 100 m (0.48 % of 3,000 V) and the loss 6.84 kW per 100 m. Bending radius 190 mm fixed, 238 mm moving; gland M75, lug bolt M20. Short-circuit rating 57.20 kA for 1 s; permitted pull 6,000 N, free-hanging length 134 m.

Averaged over all sizes copper makes up 76 % of the cable weight; the share rises from 25 % at 1×4 to 84 % at 1×400, which is why the larger sizes are costed mostly on the copper market price.

08 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 1.8/3 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, %
1×4	2.70	6.70	2.00	6.7	–	2.81	–	46
1×6	3.30	7.30	2.00	7.3	–	2.92	–	44
1×10	4.08	8.08	2.00	8.1	–	3.29	–	45
1×16	5.16	9.16	2.00	9.2	–	3.34	–	42
1×25	6.45	10.45	2.00	10.5	–	3.95	–	43
1×35	7.63	11.63	2.00	11.6	–	3.93	–	40
1×50	9.12	13.12	2.00	13.1	–	4.21	–	39
1×70	10.79	14.79	2.00	14.8	–	4.59	–	38
1×95	12.57	16.57	2.00	16.6	–	4.98	–	38
1×120	14.13	18.13	2.00	18.1	–	5.43	–	37
1×150	15.80	19.80	2.00	19.8	–	5.31	–	35
1×185	17.55	21.55	2.00	21.5	–	6.11	–	36
1×240	19.99	23.99	2.00	24.0	–	6.16	–	34
1×300	22.35	26.35	2.00	26.3	–	6.64	–	34
1×400	25.80	29.80	2.00	29.8	–	7.33	–	33

09 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
1×4	13.1	M25	M5	10	25
1×6	14.0	M25	M5	11	30
1×10	15.6	M25	M6	11	30
1×16	16.8	M25	M6	12	35
1×25	19.5	M32	M8	14	40
1×35	20.7	M32	M8	16	40
1×50	22.9	M32	M10	19	45
1×70	25.5	M40	M10	26	50
1×95	28.0	M40	M12	31	55
1×120	31.0	M40	M12	35	60
1×150	32.5	M50	M12	41	65
1×185	36.0	M50	M16	47	70
1×240	38.5	M63	M16	57	75
1×300	42.0	M63	M16	57	85
1×400	47.5	M75	M20	57	95

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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10 Comparison with Related Variants at Size 1×70

Variant	Differs in	Outer Ø / H mm	Weight kg/km	Pull N	Current A
This datasheet NSGAFöu 1.8/3 kV	–	25.5	950	1,050	247
NSGAFöu 1.8/3 kV 1×70	tinned vs bare copper	25.5 (+0%)	950 (+0%)	1,050 (+0%)	250 (+1%)
NSGAFöu 1.8/3 kV 1×70	low-temperature sheath	25.5 (+0%)	950 (+0%)	1,050 (+0%)	247 (+0%)
NSGAFCöu 1.8/3 kV 1×70	overall screen	26.5 (+4%)	1,000 (+5%)	1,050 (+0%)	247 (+0%)
NSGAFöu 0.66/1.14 kV 1×70	voltage class	23.1 (-9%)	890 (-6%)	1,050 (+0%)	247 (+0%)
NSGAFöu 3.6/6 kV 1×70	voltage class	27.0 (+6%)	990 (+4%)	1,050 (+0%)	247 (+0%)
NSGAFöu 0.6/1 kV 1×70	voltage class	22.4 (-12%)	880 (-7%)	1,050 (+0%)	247 (+0%)
NSGAFöu 1.8/3 kV 1×70	tinned vs bare copper, low-temperature sheath	25.5 (+0%)	950 (+0%)	1,050 (+0%)	250 (+1%)
NSGAFCöu 1.8/3 kV 1×70	low-temperature sheath, overall screen	26.5 (+4%)	1,000 (+5%)	1,050 (+0%)	247 (+0%)

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

11 Standards and Testing

Standard	Scope
DIN VDE 0250-602	Special rubber-insulated single-core cables
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 and current-carrying capacity
DIN EN 60332-1-2 / IEC 60332-1-2	Flame propagation

Routine and type tests

- AC voltage test on every drum length (routine test): 4.5 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

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 0250-602. 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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12 Installation, Marking and Delivery

Installation guidance

- Lay the single-core cables of one three-phase circuit together in trefoil or flat touching formation to keep the current sharing equal.
- Do not enclose single cores individually in magnetic steel (for example a steel gland plate) without a slot or non-magnetic insert.
- Use lugs and ferrules matched to the conductor cross-section and crimp with the correct tool and die.
- Observe the bending radius in section 04 and avoid sharp bends at the lug.
- Fix the cable at regular intervals with clamps that do not cut into the sheath.
- For the screened version terminate the copper braid at one or both ends according to the EMC concept.

Sheath marking

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FEICHUN NSGAFöu [cross-section] 1.8/3 kV [year] [serial no.] [metre mark]
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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: NSGAFöu 1×70 1.8/3 kV – 500 m on one drum. When requesting a quotation, state the cable type, configuration, cross-section, voltage, conductor (tinned), length per piece, required standards and installation conditions.

13 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.

14 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.

- NSGAFöu 1.8/3 kV – tinned vs bare copper, CR rubber, low-temp
- NSGAFöu 1.8/3 kV – low-temperature sheath, CR rubber, tinned
- NSGAFCöu 1.8/3 kV – overall screen, CR rubber, low-temp, tinned
- NSGAFöu 0.66/1.14 kV – voltage class, CR rubber, low-temp, tinned
- NSGAFöu 3.6/6 kV – voltage class, CR rubber, low-temp, tinned
- NSGAFöu 0.6/1 kV – voltage class, CR rubber, low-temp, tinned
- NSGAFöu 1.8/3 kV – tinned vs bare copper, low-temperature sheath, CR rubber
- NSGAFCöu 1.8/3 kV – low-temperature sheath, overall screen, CR rubber, tinned

Overview of all NSGAFöu datasheets: NSGAFöu Single-Core Rubber Cables

Frequently asked questions

Where is NSGAFöu typically used?
In rail vehicles and buses, in switchgear and in drive systems that need flexible, short-circuit-proof single-core cables.

Can single-core cables be used for a three-phase circuit?
Yes. Lay the three cables together and use non-magnetic glands or slotted gland plates so that no circulating currents heat the metal.

What sizes are available for NSGAFöu?
15 sizes from 4 to 400 mm². The outer dimension of the largest size, 1×400, is 47.5 mm and the weight is about 4,560 kg/km.

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What current can 1×70 carry?
247 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.

15 Trademark Notice and Intellectual Property

Cable type designations such as NSGAFöu 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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Document control

Document no. FC-TDS-VDE-2026-0426-EN
Revision 0 — first issue
Date 2 November 2026
Product NSGAFöu 1.8/3 kV

Prepared — Engineering | Checked — QC | Approved — International Business

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