DIN VDE 0250-813 · MV TRAILING AND REELING CABLE | 12/20 kV | 8 sizes | CR rubber | TINNED COPPER | TENSILE SUPPORT BRAID

(N)TSCGEWöu-F-HT 3×+3E+12FO 12/20 kV

Medium-Voltage Trailing and Reeling Cable 12/20 kV – 3 screened power cores + 3 split PE conductors + 12-fibre single-mode optical element. Polychloroprene rubber sheath. Complete technical data sheet: construction, dimensions, weights, current ratings, voltage drop and installation guidance for 8 sizes.

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01 Application and Product Overview

(N)TSCGEWöu-F-HT is a medium-voltage trailing cable to DIN VDE 0250-813 for mobile equipment that is supplied from a drag cable or a cable reel. Three individually screened, EPR-insulated power cores and three split protective conductors are stranded together, bedded in a rubber inner sheath and covered with an oil-resistant polychloroprene outer sheath. The cable is used for 12/20 kV supply of excavators, shovels, crushers and reclaimers.

Design

Each power core has an inner and an outer semi-conductive layer extruded together with the EPR insulation and a tinned or bare copper-wire braid screen. This keeps the electric field inside the core insulation and lets the cores be terminated with standard medium-voltage accessories. The three protective conductors lie in the outer interstices and carry the earth current; their total cross-section is stated in the designation (for example 3×50+3×25/3E means three conductors of 50 mm² and three protective conductors of 25 mm² in total). The inner and outer sheath are polychloroprene rubber.

Typical applications

- Electric rope shovels, draglines and large excavators fed through a cable reel
- Bucket-wheel excavators, stackers and reclaimers in open-cast mines and bulk-material plants
- Mobile crushing and screening plants and relocatable conveyor drive stations
- Mobile transformer stations, skid-mounted switchgear and pump sets
- Ship-to-shore and harbour cranes fed from a reel at medium voltage
- Tunnelling machines and long-wall equipment with medium-voltage supply
- Steep ramps, shafts and long free-hanging lengths where the aramid braid carries the axial load
- Replacement of existing (N)TSCGEWöu cabling to DIN VDE 0250-813

8 sizes	12/20 kV	+90 °C	CR rubber
Cross-section 25 – 185 mm²	Rated voltage U_0/U	Maximum conductor temperature	Sheath: CR rubber

Key features

- Individually screened cores with semi-conductive layers for 12/20 kV
- Split PE conductors in the outer interstices for a round, torsion-stable core
- Oil-resistant polychloroprene sheath; flame-retardant to IEC 60332-1-2
- Permanent tensile load 15 N/mm², dynamic load 30 N/mm² on the copper cross-section
- Reeling bending radius 12.5 × D, trailing 10 × D, fixed 6 × D
- Short-circuit temperature 250 °C; rated 90 °C at the conductor

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- 8 sizes from 25 to 185 mm²; weight from 3,320 to 11,040 kg/km; copper from 960 to 6,240 kg/km

Core layout and conductor

Three power cores and three split protective conductors in the outer interstices of the stranded core, laid with a short lay length. The power cores are individually screened with semi-conductive layers and a copper braid. A central 12-fibre single-mode (G.652.D) optical element carries data through the same reel channel. 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 0250-813 defines the medium-voltage trailing cable (N)TSCGEWöu in the voltage classes 3.6/6 kV to 18/30 kV. The standard specifies the screened core design, the protective-conductor arrangement and the dimensional and test requirements; the R(N)TSCGEWöu version is the design for reeling duty.

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.

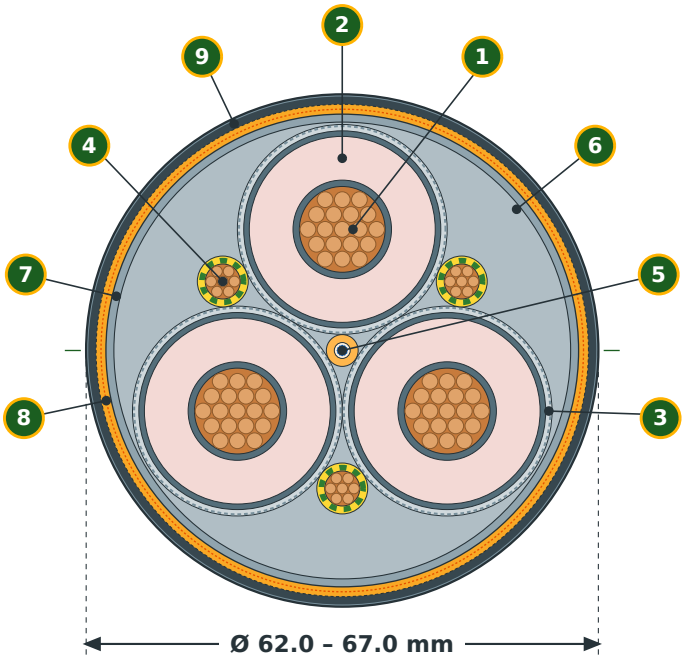
12/20 kV suits 20 kV systems with a maximum operating voltage of 24 kV. The insulation wall is 5.5 mm; the test voltage is 29 kV.

02 Construction

FEICHUN · CROSS-SECTION A–A · 12/20 kV

(N)TSCGEWöu-F-HT

Sample size 3×70+3×35/3E+12FO · 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	Semi-conductive layers and insulation	Inner and outer semi-conductive compound with EPR insulation (3GI3), extruded together
3	Core screen	Tinned copper-wire braid, coverage ≥ 80 %
4	Split PE conductor	Class 5 copper, green-yellow insulation, laid in the outer interstices between the power cores
5	Optical element	12 single-mode G.652.D fibres in a compression-resistant loose tube
6	Filler and binder tape	Rubber or compound filler with polyester binder tape
7	Inner sheath	Rubber compound, extruded over the stranded core
8	Tensile support braid	Aramid yarn braid between inner and outer sheath; carries the axial load
9	Outer sheath	Polychloroprene (CR) rubber, type 5GM5

The drawing shows size 3×70+3×35/3E+12FO. 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	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 screen	Semi-conductive layers extruded with the insulation; tinned copper-wire braid screen
Core identification	Power cores brown, black, grey; protective conductors green-yellow
Stranding	Power cores, split PE conductors and auxiliary elements stranded together with a short lay length
Inner sheath	Rubber compound; thickness about 1.0 mm at this size
Tensile support braid	Aramid yarn braid, 1.24 mm thick, between inner and outer sheath
Outer sheath	Polychloroprene (CR) rubber, type 5GM5; thickness about 1.2 mm at this size

03 Electrical, Thermal and Mechanical Characteristics

Electrical data

Rated voltage U_0/U	12/20 kV AC
Test voltage	29 kV AC, 5 min
Maximum operating voltage, three-phase	24 kV
Maximum operating voltage, DC (core-earth / core-core)	18/36 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	−40 °C to +80 °C
Ambient temperature, in motion	−25 °C to +80 °C
Minimum bending radius	Fixed: 6 × D; trailing: 10 × D; on a cable reel: 12.5 × D
Maximum tensile load	15 N/mm² on the copper cross-section plus the permissible load of the aramid support braid
Flame propagation	IEC 60332-1-2 / DIN EN 60332-1-2
Halogen-free	No (CR rubber)
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 – 12/20 kV (8 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
3×25+3×25/3E+12FO	FC-NTSC-0550-01	6.5	52.5	57.0	342	570	3,320	960	10,380	0.795	137	3.58
3×35+3×25/3E+12FO	FC-NTSC-0550-02	7.7	54.5	59.5	357	595	3,840	1,250	11,500	0.565	170	5.00
3×50+3×25/3E+12FO	FC-NTSC-0550-03	9.2	57.5	62.5	375	625	4,600	1,680	13,050	0.393	212	7.15
3×70+3×35/3E+12FO	FC-NTSC-0550-04	10.8	62.0	67.0	402	670	5,510	2,350	14,980	0.277	262	10.01
3×95+3×50/3E+12FO	FC-NTSC-0550-05	12.6	68.0	74.0	444	740	6,880	3,220	17,330	0.210	317	13.59
3×120+3×70/3E+12FO	FC-NTSC-0550-06	14.2	71.0	77.0	462	770	7,730	4,130	19,570	0.164	367	17.16
3×150+3×70/3E+12FO	FC-NTSC-0550-07	15.8	75.0	81.5	489	815	9,170	4,990	22,160	0.132	422	21.45
3×185+3×95/3E+12FO	FC-NTSC-0550-08	17.6	79.0	86.0	516	860	11,040	6,240	25,090	0.108	481	26.45

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 and the multi-core reduction factor already included in the table. 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.

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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)
3×25+3×25/3E+12FO	1,120	11,510	9,260	10,380	318	1,424	840
3×35+3×25/3E+12FO	1,580	13,070	9,920	11,500	305	1,488	710
3×50+3×25/3E+12FO	2,250	15,300	10,800	13,050	289	1,562	635
3×70+3×35/3E+12FO	3,150	18,130	11,830	14,980	277	1,676	495
3×95+3×50/3E+12FO	4,280	21,600	13,050	17,330	256	1,850	315
3×120+3×70/3E+12FO	5,400	24,970	14,170	19,570	258	1,924	220
3×150+3×70/3E+12FO	6,750	28,910	15,410	22,160	246	2,038	150
3×185+3×95/3E+12FO	8,320	33,420	16,770	25,090	231	2,150	145

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 0.10 Ω/km (three-phase). The percentage refers to a system voltage of 20,000 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 20,000 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
3×25+3×25/3E+12FO	137	1.01	20.67	0.10	5.71	11.31	5.06	3.58	2.06
3×35+3×25/3E+12FO	170	0.720	18.74	0.09	6.25	15.83	7.08	5.00	2.89
3×50+3×25/3E+12FO	212	0.501	16.92	0.08	6.76	22.61	10.11	7.15	4.13
3×70+3×35/3E+12FO	262	0.353	15.55	0.08	7.27	31.65	14.16	10.01	5.78
3×95+3×50/3E+12FO	317	0.268	15.06	0.08	8.07	42.96	19.21	13.59	7.84
3×120+3×70/3E+12FO	367	0.209	14.45	0.07	8.45	54.26	24.27	17.16	9.91
3×150+3×70/3E+12FO	422	0.168	14.23	0.07	8.99	67.83	30.33	21.45	12.38
3×185+3×95/3E+12FO	481	0.138	14.18	0.07	9.56	83.66	37.41	26.45	15.27

07 Selection Guide and Sizing Aid

(N)TSCGEWöu-F-HT 3×+3E+12FO covers 8 sizes. The smallest, 3×25+3×25/3E+12FO, has an outer diameter of up to 57.0 mm and weighs about 3,320 kg/km; the largest, 3×185+3×95/3E+12FO, has an outer diameter of up to 86.0 mm and weighs about 11,040 kg/km, 3.3 times as much. Across the range the rated current rises from 137 A to 481 A at 30 °C and the fixed bending radius from 342 mm to 516 mm.

Example 1. A circuit draws 142 A continuously at 40 °C ambient temperature, in a group of two cables. Temperature factor 0.91, grouping factor 0.80: required table current = 142 / (0.91 × 0.80) = 195 A. The smallest suitable size is 3×50+3×25/3E+12FO with 212 A.

Example 2. A circuit draws 323 A continuously at 35 °C ambient temperature, on its own. Temperature factor 0.96: required table current = 323 / (0.96) = 338 A. The smallest suitable size is 3×120+3×70/3E+12FO with 367 A.

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08 Engineering Profile by Size

Every size of (N)TSCGEWöu-F-HT 3×+3E+12FO with the dimensions that decide how it behaves in a circuit: layers, weight, copper share, heat, voltage drop, bending, termination and pull.

3×25+3×25/3E+12FO. This size has with a conductor of Ø 6.5 mm under semi-conductive layers and EPR insulation (core Ø 22.1 mm) and 1.0 mm inner and 0.8 mm outer sheath; outer diameter 52.5–57.0 mm, weight about 3,320 kg/km of which copper 960 kg/km (29 %). Rated current 137 A at 30 °C; at that load the voltage drop is 20.67 V per 100 m (0.10 % of 20,000 V) and the loss 5.71 kW per 100 m. Bending radius 342 mm fixed, 570 mm moving; gland M85, lug bolt M8. Short-circuit rating 3.58 kA for 1 s; permitted pull 10,380 N, free-hanging length 318 m.

3×35+3×25/3E+12FO. This size has with a conductor of Ø 7.6 mm under semi-conductive layers and EPR insulation (core Ø 23.2 mm) and 1.0 mm inner and 0.8 mm outer sheath; outer diameter 54.5–59.5 mm, weight about 3,840 kg/km of which copper 1,250 kg/km (33 %). Rated current 170 A at 30 °C; at that load the voltage drop is 18.74 V per 100 m (0.09 % of 20,000 V) and the loss 6.25 kW per 100 m. Bending radius 357 mm fixed, 595 mm moving; gland M85, lug bolt M8. Short-circuit rating 5.00 kA for 1 s; permitted pull 11,500 N, free-hanging length 305 m.

3×50+3×25/3E+12FO. This size has with a conductor of Ø 9.1 mm under semi-conductive layers and EPR insulation (core Ø 24.7 mm) and 1.0 mm inner and 0.8 mm outer sheath; outer diameter 57.5–62.5 mm, weight about 4,600 kg/km of which copper 1,680 kg/km (37 %). Rated current 212 A at 30 °C; at that load the voltage drop is 16.92 V per 100 m (0.08 % of 20,000 V) and the loss 6.76 kW per 100 m. Bending radius 375 mm fixed, 625 mm moving; gland M85, lug bolt M10. Short-circuit rating 7.15 kA for 1 s; permitted pull 13,050 N, free-hanging length 289 m.

3×70+3×35/3E+12FO. This size has with a conductor of Ø 10.8 mm under semi-conductive layers and EPR insulation (core Ø 26.4 mm) and 1.0 mm inner and 1.2 mm outer sheath; outer diameter 62.0–67.0 mm, weight about 5,510 kg/km of which copper 2,350 kg/km (43 %). Rated current 262 A at 30 °C; at that load the voltage drop is 15.55 V per 100 m (0.08 % of 20,000 V) and the loss 7.27 kW per 100 m. Bending radius 402 mm fixed, 670 mm moving; gland M90, lug bolt M10. Short-circuit rating 10.01 kA for 1 s; permitted pull 14,980 N, free-hanging length 277 m.

3×95+3×50/3E+12FO. This size has with a conductor of Ø 12.6 mm under semi-conductive layers and EPR insulation (core Ø 28.2 mm) and 1.0 mm inner and 2.5 mm outer sheath; outer diameter 68.0–74.0 mm, weight about 6,880 kg/km of which copper 3,220 kg/km (47 %). Rated current 317 A at 30 °C; at that load the voltage drop is 15.06 V per 100 m (0.08 % of 20,000 V) and the loss 8.07 kW per 100 m. Bending radius 444 mm fixed, 740 mm moving; gland M100, lug bolt M12. Short-circuit rating 13.59 kA for 1 s; permitted pull 17,330 N, free-hanging length 256 m.

3×120+3×70/3E+12FO. This size has with a conductor of Ø 14.1 mm under semi-conductive layers and EPR insulation (core Ø 29.7 mm) and 1.0 mm inner and 2.3 mm outer sheath; outer diameter 71.0–77.0 mm, weight about 7,730 kg/km of which copper 4,130 kg/km (53 %). Rated current 367 A at 30 °C; at that load the voltage drop is 14.45 V per 100 m (0.07 % of 20,000 V) and the loss 8.45 kW per 100 m. Bending radius 462 mm fixed, 770 mm moving; gland M100, lug bolt M12. Short-circuit rating 17.16 kA for 1 s; permitted pull 19,570 N, free-hanging length 258 m.

3×150+3×70/3E+12FO. This size has with a conductor of Ø 15.8 mm under semi-conductive layers and EPR insulation (core Ø 31.4 mm) and 1.0 mm inner and 2.6 mm outer sheath; outer diameter 75.0–81.5 mm, weight about 9,170 kg/km of which copper 4,990 kg/km (54 %). Rated current 422 A at 30 °C; at that load the voltage drop is 14.23 V per 100 m (0.07 % of 20,000 V) and the loss 8.99 kW per 100 m. Bending radius 489 mm fixed, 815 mm moving; gland special, lug bolt M12. Short-circuit rating 21.45 kA for 1 s; permitted pull 22,160 N, free-hanging length 246 m.

3×185+3×95/3E+12FO. This size has with a conductor of Ø 17.5 mm under semi-conductive layers and EPR insulation (core Ø 33.1 mm) and 1.0 mm inner and 2.8 mm outer sheath; outer diameter 79.0–86.0 mm, weight about 11,040 kg/km of which copper 6,240 kg/km (57 %). Rated current 481 A at 30 °C; at that load the voltage drop is 14.18 V per 100 m (0.07 % of 20,000 V) and the loss 9.56 kW per 100 m. Bending radius 516 mm fixed, 860 mm moving; gland special, lug bolt M16. Short-circuit rating 26.45 kA for 1 s; permitted pull 25,090 N, free-hanging length 231 m.

Averaged over all sizes copper makes up 48 % of the cable weight; the share rises from 29 % at 3×25+3×25/3E+12FO to 57 % at 3×185+3×95/3E+12FO, 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 12/20 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, %
3×25+3×25/3E+12FO	6.45	22.05	semi-cond. + EPR	48.8	1.00	0.80	1.14	11
3×35+3×25/3E+12FO	7.63	23.23	semi-cond. + EPR	51.1	1.00	0.80	1.16	10
3×50+3×25/3E+12FO	9.12	24.72	semi-cond. + EPR	54.1	1.00	0.80	1.20	10
3×70+3×35/3E+12FO	10.79	26.39	semi-cond. + EPR	57.5	1.00	1.25	1.24	11
3×95+3×50/3E+12FO	12.57	28.17	semi-cond. + EPR	61.3	1.00	2.55	1.29	14
3×120+3×70/3E+12FO	14.13	29.73	semi-cond. + EPR	64.7	1.00	2.33	1.33	13
3×150+3×70/3E+12FO	15.80	31.40	semi-cond. + EPR	68.3	1.00	2.56	1.37	13
3×185+3×95/3E+12FO	17.55	33.15	semi-cond. + EPR	72.0	1.00	2.81	1.41	13

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
3×25+3×25/3E+12FO	57.0	M85	M8	14	170
3×35+3×25/3E+12FO	59.5	M85	M8	16	180
3×50+3×25/3E+12FO	62.5	M85	M10	19	190
3×70+3×35/3E+12FO	67.0	M90	M10	26	200
3×95+3×50/3E+12FO	74.0	M100	M12	31	220
3×120+3×70/3E+12FO	77.0	M100	M12	35	230
3×150+3×70/3E+12FO	81.5	special	M12	41	245
3×185+3×95/3E+12FO	86.0	special	M16	47	260

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 3×70+3×35/3E+12FO

Variant	Differs in	Outer Ø / H mm	Weight kg/km	Pull N	Current A
This datasheet (N)TSCGEWöu-F-HT 3×+3E+12FO 12/20 kV	–	67.0	5,510	14,980	262
(N)TSCGEWöu-C-HT 3×+3E+2×1.5 12/20 kV 3×70+3×35/3E+2×1.5	core configuration	67.0 (+0%)	5,530 (+0%)	14,980 (+0%)	262 (+0%)
(N)TSCGEWöu-P-HT 3×+3E+2×2.5 12/20 kV 3×70+3×35/3E+2×2.5	core configuration	67.0 (+0%)	5,550 (+1%)	14,980 (+0%)	262 (+0%)
(N)TSCGEWöu-F-HT 3×+3E+12FO 12/20 kV 3×70+3×35/3E+12FO	tinned vs bare copper	67.0 (+0%)	5,510 (+0%)	14,980 (+0%)	265 (+1%)
(N)TSCGEWöu-F 3×+3E+12FO 12/20 kV 3×70+3×35/3E+12FO	tensile braid	64.5 (-4%)	5,230 (-5%)	3,150 (-79%)	262 (+0%)
R(N)TSCGEWöu-F-HT 3×+3E+12FO 12/20 kV 3×70+3×35/3E+12FO	reeling design	67.0 (+0%)	5,510 (+0%)	14,980 (+0%)	262 (+0%)
(N)TSCGEWöu-F-HT 3×+3E+12FO 8.7/15 kV 3×70+3×35/3E+12FO	voltage class	63.0 (-6%)	5,100 (-7%)	13,740 (-8%)	254 (-3%)
(N)TSCGEWöu-HT 3×+3E 12/20 kV 3×70+3×35/3E	core configuration	67.0 (+0%)	5,500 (-0%)	14,980 (+0%)	262 (+0%)
(N)TSCGEWöu-F-HT 3×+3E+12FO 18/30 kV 3×70+3×35/3E+12FO	voltage class	78.5 (+17%)	6,700 (+22%)	18,560 (+24%)	272 (+4%)

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 0250-813	Trailing cable (N)TSCGEWöu, 3.6/6 kV to 18/30 kV
DIN VDE 0295 / IEC 60228	Conductors, class 5
DIN VDE 0207-20 / -21	Rubber insulation and sheath compounds
DIN VDE 0298-3 / -4	Application and current-carrying capacity
DIN EN 60332-1-2 / IEC 60332-1-2	Flame propagation
IEC 60502-2 (reference)	Partial-discharge and voltage testing practice for screened MV cores

Routine and type tests

- AC voltage test on every drum length (routine test): 29 kV, 5 min
- Partial-discharge test of the screened power cores
- Conductor resistance and checks of dimensions, insulation thickness and sheath thickness
- Continuity of conductors and protective earth
- 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)

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 0250-813. 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

- Terminate the core screens with MV accessories rated for the voltage class and ground the screens at both ends.
- Use a reel core diameter of at least 2 × the reeling bending radius; wind in orderly layers without cross-over.
- Avoid torsion above the limit agreed with FeiChun for the reel design; release twist before respooling.
- Connect all three split PE conductors at both ends.
- Lay drag cables on a prepared surface and protect them against vehicle crossings with cable ramps.
- Carry out a voltage test of the installed cable after termination, with the test voltage in the table of section 03.

Sheath marking

FEICHUN (N)TSCGEWöu-F-HT [cross-section] 12/20 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: (N)TSCGEWöu-F-HT 3×70+3×35/3E+12FO 12/20 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.

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.

- (N)TSCGEWöu-C-HT 3×+3E+2×1.5 12/20 kV – core configuration, CR rubber, tinned
- (N)TSCGEWöu-P-HT 3×+3E+2×2.5 12/20 kV – core configuration, CR rubber, tinned
- (N)TSCGEWöu-F-HT 3×+3E+12FO 12/20 kV – tinned vs bare copper, CR rubber
- (N)TSCGEWöu-F 3×+3E+12FO 12/20 kV – tensile braid, CR rubber, tinned
- R(N)TSCGEWöu-F-HT 3×+3E+12FO 12/20 kV – reeling design, CR rubber, tinned
- (N)TSCGEWöu-F-HT 3×+3E+12FO 8.7/15 kV – voltage class, CR rubber, tinned
- (N)TSCGEWöu-HT 3×+3E 12/20 kV – core configuration, CR rubber, tinned
- (N)TSCGEWöu-F-HT 3×+3E+12FO 18/30 kV – voltage class, CR rubber, tinned

Overview of all (N)TSCGEWöu datasheets: (N)TSCGEWöu Medium-Voltage Trailing Cables

Frequently asked questions

What does 3×50+3×25/3E mean?
Three power cores of 50 mm² and three protective (PE) conductors with a total cross-section of 25 mm² (the /3 divides it into three conductors), designated E.

What is the difference between (N)TSCGEWöu and R(N)TSCGEWöu?
The R version is designed for reeling duty with a lighter, more flexible core and a smaller permitted bending radius on the reel; the unprefixed version is the drag-cable design.

What sizes are available for (N)TSCGEWöu-F-HT 3×+3E+12FO?
8 sizes from 25 to 185 mm². The outer dimension of the largest size, 3×185+3×95/3E+12FO, is 86.0 mm and the weight is about 11,040 kg/km.

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What current can 3×95+3×50/3E+12FO carry?
317 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 (N)TSCGEWöu-F-HT 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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