(N)TSCGEWÖU - FO (LWL)

Trailing Cable With Integrated Fiber Optic

CABLE STRUCTURE

Conductors	Electrolytic, stranded, tinned copper wire DIN VDE 0295 Class 5
Insulation	3GI3 Type EPR Compound
Electrical Field Control	Inner and Outer Semiconductive layer of semiconductive rubber
Protective - Earth Conductor	Tinned Copper conductor with semiconductive layer
Optical Fiber	Fibre core diameter of fiber 9 µm, 62.5 µm or 50 µm; Diameter over cladding 125 µm; diameter over coating 250 µm; designs up to 24 fibers available.
Fiber Coading	Color codingof the fibers and buffering tube for idendification of the fiber type.
Fiber Covering	Hollow core with filling compound, basic material ETFE
Arrangement Of Fiber Cores	Six cores in one layer and specially laid-up around the central support element.
Lay Up	Three main conductors laid-up with two control cores and fiber optic element in the outer interstice
Inner Sheath	GM1b type EPR compound
Reinforcement	Embedded braid made of anti torsion synthetic threads
Outer Sheath	5GM5 type elastomer compound, Red

PRODUCTION AND TEST STANDARDS

Construction	Based on DIN VDE 0250-812
General Requirements	DIN VDE 0250-1
Guide to Use	DIN VDE 0298-3
Electrical Tests	DIN VDE 0472-501, 503, 508
Non-Electrical Tests	DIN VDE 0472-401, 402, 602, 303, 615
Under Fire Conditions Tests	DIN VDE 0472-803, 804
Flame Retardant	VDE 0482-332-1-2, DIN EN 60332-1-2, IEC 60332-1
Oil Resistant	HD/EN/IEC 60811-2-1, DIN VDE 0473-811-2-1

Ozone Resistant · Cold Resistant · Tear Resistant · Uv Resistant · Weather Resistant · Moisture Resistant · Ex-Proof

OPERATING CHARACTERISTICS

Rated Voltage	3,6/6 kV	6/10 kV	8,7/15 kV	12/20 kV	18/30 kV
AC Test Voltage	11 kV	17 kV	24 kV	29 kV	43 kV
Max. Permissible Operating Voltage AC	4,2/7,2 kV	6,9/12 kV	10,4/18 kV	13,9/24 kV	20,8/36 kV
Max. Permissible Operating Voltage DC	5,4/10,8 kV	9/18 kV	13,5/27 kV	18/36 kV	27/54 kV
Min. Bending Radius	Acc. to DIN VDE 0298 part 3				
Current Carrying Capacity	According to DIN VDE 0298, Part 4				
Working Temperature					
Fixed	-40°C .. +80°C				
Mobile	-25°C .. +80°C				
Max. Tensile Load of cable	20 N/mm²				
Max. Torsion	25°/m				
Travel Speed for tunnelling app.	max.30 m/min.				
Minimum distarce for change of direction	20 X D				

Application
For the connection of electrical equipment, large material handling machines such as excavators, cranes, dumpers in mining and tunnelling applications in combination of power and data transmission. The flexible cable design allows for movement of the equipment during operation. Suitable also as flex MV reeling cable and also for festoon systems

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3,6/6 kV

Cross Section (mm^2)	Overall Diameter Min - Max (mm)	Permissible Tensile Force Max. (N)	Conductor Resistance At 20 °C (Ω/km)	Approximate weight (kg / km)
3 x 25 + 2 x 25/2 + FO	42.2 - 45.2	1500	0.78	2660
3 x 25 + 2 x 50/2 + FO	45.0 - 48.0	1500	0.78	2990
3 x 35 + 2 x 25/2 + FO	43.8 - 46.8	2100	0.554	3050
3 x 35 + 2 x 50/2 + FO	45.9 - 48.9	2100	0.554	3400
3 x 50 + 2 x 25/2 + FO	45.1 - 48.1	3000	0.386	3540
3 x 50 + 2 x 50/2 + FO	48.8 - 51.8	3000	0.386	4070
3 x 70 + 2 x 35/2 + FO	48.8 - 51.8	4200	0.272	4480
3 x 70 + 2 x 50/2 + FO	52.5 - 56.5	4200	0.272	4840
3 x 95 + 2 x 50/2 + FO	54.3 - 58.3	5700	0.206	5800
3 x 120 + 2 x 70/2 + FO	58.2 - 62.2	7200	0.161	7010
3 x 150 + 2 x 70/2 + FO	62.4 - 66.4	9000	0.129	8210
3 x 185 + 2 x 95/2 + FO	67.8 - 71.8	11100	0.106	9920
3 x 240 + 2 x 120/2 + FO	74.4 - 78.4	14400	0.08	12530
3 x 300 + 2 x 150/2 + FO	80.6 - 85.6	18000	0.064	15330

6/10 kV

Cross Section (mm^2)	Overall Diameter Min - Max (mm)	Permissible Tensile Force Max. (N)	Conductor Resistance At 20 °C (Ω/km)	Approximate weight (kg / km)
3 x 25 + 2 x 25/2 + FO	42.7 - 45.7	1500	0.78	2740
3 x 25 + 2 x 50/2 + FO	46.0 - 49.0	1500	0.78	2980
3 x 35 + 2 x 25/2 + FO	45.2 - 48.2	2100	0.554	3160
3 x 35 + 2 x 50/2 + FO	47.6 - 50.6	2100	0.554	3610
3 x 50 + 2 x 25/2 + FO	46.5 - 49.5	3000	0.386	3670
3 x 50 + 2 x 50/2 + FO	50.4 - 53.4	3000	0.386	4020
3 x 70 + 2 x 35/2 + FO	50.3 - 53.3	4200	0.272	4610
3 x 70 + 2 x 50/2 + FO	53.8 - 56.8	4200	0.272	5160
3 x 95 + 2 x 50/2 + FO	55.6 - 59.6	5700	0.206	5940
3 x 120 + 2 x 70/2 + FO	60.4 - 63.4	7200	0.161	7150
3 x 150 + 2 x 70/2 + FO	65.2 - 69.2	9000	0.129	8600
3 x 185 + 2 x 95/2 + FO	69.2 - 73.2	11100	0.106	10110
3 x 240 + 2 x 120/2 + FO	77.2 - 81.2	14400	0.08	12980
3 x 300 + 2 x 150/2 + FO	81.8 - 86.8	18000	0.064	15550

8.7/15 kV

Cross Section (mm^2)	Overall Diameter Min - Max (mm)	Permissible Tensile Force Max. (N)	Conductor Resistance At 20 °C (Ω/km)	Approximate weight (kg / km)
3 x 25 + 2 x 25/2 + FO	46.0 - 49.0	1500	0.78	3000
3 x 25 + 2 x 50/2 + FO	47.4 - 51.4	1500	0.78	3350
3 x 35 + 2 x 25/2 + FO	46.3 - 49.3	2100	0.554	3550
3 x 35 + 2 x 50/2 + FO	50.1 - 53.1	2100	0.554	3710
3 x 50 + 2 x 25/2 + FO	50.1 - 53.1	3000	0.386	4020
3 x 50 + 2 x 50/2 + FO	53.8 - 57.8	3000	0.386	4640
3 x 70 + 2 x 35/2 + FO	54.8 - 58.8	4200	0.272	5170
3 x 70 + 2 x 50/2 + FO	54.8 - 58.8	4200	0.272	5280
3 x 95 + 2 x 50/2 + FO	59.2 - 63.2	5700	0.206	6370
3 x 120 + 2 x 70/2 + FO	64.6 - 68.6	7200	0.161	7830
3 x 150 + 2 x 70/2 + FO	68.8 - 72.8	9000	0.129	9090
3 x 185 + 2 x 95/2 + FO	72.8 - 76.8	11100	0.106	10610
3 x 240 + 2 x 120/2 + FO	79.7 - 84.7	14400	0.08	13540
3 x 300 + 2 x 150/2 + FO	87.9 - 92.9	18000	0.064	16530

12/20 kV

Cross Section (mm^2)	Overall Diameter Min - Max (mm)	Permissible Tensile Force Max. (N)	Conductor Resistance At 20 °C (Ω/km)	Approximate weight (kg / km)
3 x 25 + 2 x 25/2 + FO	46.5 - 49.5	1500	0.78	3070
3 x 25 + 2 x 50/2 + FO	49.5 - 52.5	1500	0.78	3400
3 x 35 + 2 x 25/2 + FO	49.3 - 52.3	2100	0.554	3590
3 x 35 + 2 x 50/2 + FO	53.1 - 57.1	2100	0.554	4200
3 x 50 + 2 x 25/2 + FO	54.1 - 58.1	3000	0.386	4500
3 x 50 + 2 x 50/2 + FO	54.1 - 58.1	3000	0.386	4590
3 x 70 + 2 x 35/2 + FO	58.0 - 62.0	4200	0.272	5540
3 x 70 + 2 x 50/2 + FO	58.0 - 62.0	4200	0.272	5650
3 x 95 + 2 x 50/2 + FO	62.4 - 66.4	5700	0.206	6750
3 x 120 + 2 x 70/2 + FO	67.7 - 71.7	7200	0.161	8400
3 x 150 + 2 x 70/2 + FO	71.9 - 75.9	9000	0.129	9520
3 x 185 + 2 x 95/2 + FO	77.3 - 81.3	11100	0.106	11340
3 x 240 + 2 x 120/2 + FO	83.8 - 87.8	14400	0.08	14060
3 x 300 + 2 x 150/2 + FO	91.0 - 96.0	18000	0.064	17090

14/25 kV

Cross Section (mm^2)	Overall Diameter Min - Max (mm)	Permissible Tensile Force Max. (N)	Conductor Resistance At 20 °C (Ω/km)	Approximate weight (kg / km)
03 x 25 + 2 x 25/2 + FO	50.5 - 53.5	1500	0.78	3460
3 x 25 + 2 x 50/2 + FO	50.5 - 53.5	1500	0.78	3550
3 x 35 + 2 x 25/2 + FO	54.2 - 57.2	2100	0.554	4180
3 x 35 + 2 x 50/2 + FO	54.2 - 57.2	2100	0.554	4260
3 x 50 + 2 x 25/2 + FO	57.0 - 61.0	3000	0.386	4980
3 x 50 + 2 x 50/2 + FO	57.0 - 61.0	3000	0.386	5050
3 x 70 + 2 x 35/2 + FO	62.0 - 66.0	4200	0.272	6020
3 x 70 + 2 x 50/2 + FO	62.0 - 66.0	4200	0.272	6130
3 x 95 + 2 x 50/2 + FO	67.9 - 71.9	5700	0.206	7500
3 x 120 + 2 x 70/2 + FO	71.6 - 75.6	7200	0.161	8790
3 x 150 + 2 x 70/2 + FO	77.3 - 81.3	9000	0.129	10390
3 x 185 + 2 x 95/2 + FO	81.4 - 85.4	11100	0.106	11980
3 x 240 + 2 x 120/2 + FO	89.2 - 94.2	14400	0.08	15130
3 x 300 + 2 x 150/2 + FO	95.0 - 100.0	18000	0.064	17830

18/30 kV

Cross Section (mm^2)	Overall Diameter Min - Max (mm)	Permissible Tensile Force Max. (N)	Conductor Resistance At 20 °C (Ω/km)	Approximate weight (kg / km)
03 x 25 + 2 x 25/2 + FO	55.1 - 59.1	1500	0.78	4020
3 x 25 + 2 x 50/2 + FO	55.1 - 59.1	1500	0.78	4100
3 x 35 + 2 x 25/2 + FO	58.0 - 62.0	2100	0.554	4590
3 x 35 + 2 x 50/2 + FO	58.0 - 62.0	2100	0.554	4670
3 x 50 + 2 x 25/2 + FO	61.8 - 65.8	3000	0.386	5410
3 x 50 + 2 x 50/2 + FO	61.8 - 65.8	3000	0.386	5480
3 x 70 + 2 x 35/2 + FO	67.0 - 71.0	4200	0.272	6710
3 x 70 + 2 x 50/2 + FO	67.0 - 71.0	4200	0.272	6810
3 x 95 + 2 x 50/2 + FO	71.4 - 75.4	5700	0.206	7960
3 x 120 + 2 x 70/2 + FO	76.7 - 80.7	7200	0.161	9510
3 x 150 + 2 x 70/2 + FO	81.0 - 85.0	9000	0.129	10950
3 x 185 + 2 x 95/2 + FO	83.9 - 88.9	11100	0.106	12560
3 x 240 + 2 x 120/2 + FO	92.8 - 97.8	14400	0.08	15770
3 x 300 + 2 x 150/2 + FO	99.6 - 104.6	18000	0.064	18770

20/35 kV

Cross Section (mm^2)	Overall Diameter Min - Max (mm)	Permissible Tensile Force Max. (N)	Conductor Resistance At 20 °C (Ω/km)	Approximate weight (kg / km)
3 x 25 + 2 x 25/2 + FO	59.8 - 63.8	1500	0.78	4580
3 x 35 + 2 x 25/2 + FO	64.4 - 68.4	2100	0.554	5410
3 x 50 + 2 x 25/2 + FO	68.1 - 72.1	3000	0.386	6270
3 x 50 + 2 x 35/2 + FO	68.1 - 72.1	3000	0.386	6350
3 x 70 + 2 x 35/2 + FO	71.8 - 75.8	4200	0.272	7350