AnHui Feichun Special Cable Co., Ltd

TENAX-TTS-LWL

Medium Voltage Reeling Cable with Integrated Fiber-Optics

Type: (N)TSCGEWOEU
Standard: DIN VDE 0250-813
Edition: Complete Technical Spec

Cable Structure





Product Overview

Application:

Flexible medium voltage reeling cable with integrated fiber-optics for combined transmission of energy and data under high mechanical stresses, including high travel speeds, dynamic tensile loads, multiple directional changes, and torsional stresses. Ideal for fast-moving container cranes and large mobile equipment.

Key Features:

- ✓ Superior torsional resistance (±50°/m)
- ✓ Integrated 12 fiber-optics for data transmission
- ✓ EPR-SHS EI6 super-clean insulation
- ✓ Extended temperature range (-40°C to +80°C)
- ✓ High-speed operation (up to 180 m/min)
- ✓ Unrestricted bend radius (20×D)

Global Technical Data

Brand	TENAX-TTS
Type Designation	(N)TSCGEWOEU
Standard	Based on DIN VDE 0250-813
Conductor	Plain copper, fine stranded, class 5 (DIN EN 60228 / VDE 0295)
Insulation	EPR-SHS EI6 super-clean rubber compound with semiconductive layers
Core Arrangement	3 Power + 2 Split Earth Conductors + 1 Fiber-Optic Tube (12 fibers)
Inner Sheath	Rubber (5GM3) with conductive aramid rope center
Reinforcement	Polyester anti-torsion braid
Outer Sheath	5GM5 abrasion-proof rubber (oil & ozone resistant)
Sheath Color	Red or Black with Yellow Stripe

Optical Fiber Specifications (LWL Integration)

Standard Configuration: 12 single-mode or multimode fibers G50/125µm, G62.5/125µm, or E9/125µm

Fiber Type	G50/125 (Multimode)	G62.5/125 (Multimode)	E9/125 (Monomode)
Attenuation @850nm	<2.8 dB/km	<3.3 dB/km	<0.4 dB/km
Attenuation @1300nm	<0.8 dB/km	<0.9 dB/km	<0.3 dB/km
Attenuation @1550nm	-	-	<0.3 dB/km
Bandwidth @850nm	>400 MHz	>200 MHz	N/A
Numerical Aperture	0.2 ± 0.02	0.27 ± 0.02	-
Chromatic Dispersion @1300nm	-	-	<3.5 ps/nm·km
Chromatic Dispersion @1550nm	-	-	<18 ps/nm·km

Electrical Parameters

Voltage Rating	Max Operating Voltage (AC)	AC Test Voltage
3.6/6 kV	6.9/12 kV	17 kV
6/10 kV	10.4/18 kV	24 kV
8.7/15 kV	13.5/27 kV	29 kV
12/20 kV	13.9/24 kV	29 kV

Thermal Parameters

Max Conductor Temperature (continuous)	90°C
Max Short Circuit Temperature	250°C
Ambient Temp (Fixed Installation)	-40°C to +80°C
Ambient Temp (Flexible Operation)	-25°C to +80°C

Mechanical Parameters

Max Tensile Load (Standard)	20 N/mm²
Max Tensile Load (Acceleration)	25 N/mm²
Torsional Stress	±50°/m Superior
Min Bending Radius	20 × Diameter (Free Moving)
Travel Speed (Reeling)	Up to 180 m/min

Rated Voltage: 3.6/6 kV (7 Configurations)

Cores x Section	Ø max (mm)	Ø min (mm)	Ø max (mm)	Weight (kg/km)	Tensile Max (N)	Dyn Tensile (N)	Resistance (Ω/km)	Capacitance (µF/km)	Reactance (Ω/km)	Current (A)	I²t (kA)
3×25 + 2×25/2 + FO	6.2	38.5	41.5	2.38	1500	1875	0.78	0.38	0.102	131	3.58
3×35 + 2×25/2 + FO	7.7	41.5	44.5	2.75	2100	2625	0.55	0.49	0.092	162	5.01
3×50 + 2×25/2 + FO	9.3	44.5	47.5	3.10	3000	3750	0.39	0.49	0.092	202	7.15
3×70 + 2×35/2 + FO	11.5	50.0	54.0	4.40	4200	5250	0.27	0.55	0.088	250	10.01
3×95 + 2×50/2 + FO	12.8	54.0	58.0	5.30	5700	7125	0.21	0.62	0.084	301	13.59
3×150 + 2×70/2 + FO	16.5	63.0	67.0	7.60	9000	11250	0.13	0.73	0.080	404	21.45
3×185 + 2×95/2 + FO	18.5	67.0	72.0	9.20	11100	13875	0.11	0.79	0.078	461	26.46

(1) Nominal current carrying capacity for cables laid on a surface at 30°C ambient temperature (DIN VDE 0298-4, Table 15)

Rated Voltage: 6/10 kV (9 Configurations)

Cores x Section	P/N	Ø max (mm)	Ø min (mm)	Ø max (mm)	Weight (kg/km)	Tensile Max (N)	Dyn Tensile (N)	Resistance (Ω/km)	Capacitance (µF/km)	Reactance (Ω/km)	Current (A)	I²t (kA)
3×25 + 2×25/2 + FO	20091982	6.2	40.0	43.0	2.48	1500	1875	0.78	0.35	0.104	131	3.58
3×35 + 2×25/2 + FO	20074719	7.7	42.0	45.0	2.95	2100	2625	0.55	0.39	0.099	162	5.01
3×50 + 2×25/2 + FO	20096115	9.3	45.0	48.0	3.48	3000	3750	0.39	0.45	0.094	202	7.15
3×70 + 2×35/2 + FO	20092017	11.5	51.0	55.0	4.71	4200	5250	0.27	0.51	0.090	250	10.01
3×95 + 2×50/2 + FO	20086347	12.8	55.0	59.0	5.55	5700	7125	0.21	0.58	0.086	301	13.59
3×120 + 2×70/2 + FO	-	14.9	58.5	62.5	6.70	7200	9000	0.16	0.63	0.084	352	17.16
3×150 + 2×70/2 + FO	-	16.5	63.0	67.0	7.60	9000	11250	0.13	0.69	0.082	404	21.45
3×240 + 2×120/2 + FO	-	21.0	73.0	78.0	12.40	14400	18000	0.08	1.05	0.080	540	34.32

(1) Nominal current carrying capacity for cables laid on a surface at 30°C ambient temperature (DIN VDE 0298-4, Table 15)

Rated Voltage: 8.7/15 kV (9 Configurations)

Cores x Section	P/N	Ø max (mm)	Ø min (mm)	Ø max (mm)	Weight (kg/km)	Tensile Max (N)	Dyn Tensile (N)	Resistance (Ω/km)	Capacitance (µF/km)	Reactance (Ω/km)	Current (A)	I²t (kA)
3×25 + 2×25/2 + FO	-	6.2	42.0	45.0	2.70	1500	1875	0.78	0.30	0.110	139	3.58
3×35 + 2×25/2 + FO	20091668	7.7	45.0	49.0	2.96	2100	2625	0.55	0.33	0.105	172	5.01
3×50 + 2×25/2 + FO	-	9.3	50.0	54.0	3.96	3000	3750	0.39	0.37	0.099	215	7.15
3×70 + 2×35/2 + FO	20114426	11.5	53.0	57.0	4.76	4200	5250	0.27	0.42	0.094	265	10.01
3×95 + 2×50/2 + FO	20153431	12.8	58.0	62.0	5.76	5700	7125	0.21	0.48	0.089	319	13.59
3×120 + 2×70/2 + FO	-	14.9	64.0	68.0	7.27	7200	9000	0.16	0.52	0.087	371	17.16
3×150 + 2×70/2 + FO	-	16.5	68.0	72.0	8.50	9000	11250	0.13	0.57	0.085	428	21.45
3×185 + 2×95/2 + FO	-	18.5	72.0	77.0	9.90	11100	13875	0.11	0.61	0.083	488	26.46

(1) Nominal current carrying capacity for cables laid on a surface at 30°C ambient temperature (DIN VDE 0298-4, Table 15)

Rated Voltage: 12/20 kV (8 Configurations)

Cores x Section	P/N	Ø max (mm)	Ø min (mm)	Ø max (mm)	Weight (kg/km)	Tensile Max (N)	Dyn Tensile (N)	Resistance (Ω/km)	Capacitance (µF/km)	Reactance (Ω/km)	Current (A)	I²t (kA)
3×25 + 2×25/2 + FO	20076107	6.2	45.0	48.0	2.89	1500	1875	0.78	0.24	0.115	139	3.58
3×35 + 2×25/2 + FO	-	7.7	47.0	50.0	3.25	2100	2625	0.55	0.27	0.109	172	5.01
3×50 + 2×25/2 + FO	-	9.3	51.0	55.0	4.05	3000	3750	0.39	0.30	0.103	215	7.15
3×70 + 2×35/2 + FO	-	11.5	56.0	60.0	4.85	4200	5250	0.27	0.34	0.098	265	10.01
3×95 + 2×50/2 + FO	-	12.8	60.0	64.0	6.45	5700	7125	0.21	0.38	0.094	319	13.59
3×120 + 2×70/2 + FO	-	14.9	66.0	70.0	7.70	7200	9000	0.16	0.41	0.091	371	17.16
3×150 + 2×70/2 + FO	-	16.5	69.0	73.0	8.55	9000	11250	0.13	0.45	0.089	428	21.45
3×185 + 2×95/2 + FO	-	18.5	75.0	79.0	10.60	11100	13875	0.11	0.49	0.086	488	26.46

(1) Nominal current carrying capacity for cables laid on a surface at 30°C ambient temperature (DIN VDE 0298-4, Table 15)

Summary & Total Configuration Count

Voltage Rating	Number of Configurations	Conductor Range
3.6/6 kV	7 configurations	3×25 to 3×185 mm²
6/10 kV	9 configurations	3×25 to 3×240 mm²
8.7/15 kV	9 configurations	3×25 to 3×185 mm²
12/20 kV	8 configurations	3×25 to 3×185 mm²
TOTAL: 33 Complete Configurations		**All Voltage Levels**

Recommended Applications

- ✓ Fast-moving container cranes (STS) with data monitoring
- ✓ Large mobile equipment requiring fiber-optic communication
- ✓ Extreme mechanical stress environments
- ✓ Multiple directional movement systems
- ✓ High-speed reeling operations (up to 180 m/min)
- ✓ Systems requiring integrated power and data transmission
- ✓ Extended temperature range applications (-40°C to +80°C)
- ✓ Remote monitoring and telemetry systems

Standards & Compliance

- ✓ DIN VDE 0250-813 (Medium Voltage Reeling Cable)
- ✓ DIN EN 60228 (Conductor Classes)
- ✓ VDE 0295 (Copper Standards)
- ✓ DIN VDE 0298 Part 4 (Current Carrying Capacity)
- ✓ IEC 60811-4 (Insulation & Sheath Testing)
- ✓ ISO/IEC 11801 (Fiber-Optic Cable Standards)

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