TFKable

We connecting globally

Crane PowerFlex

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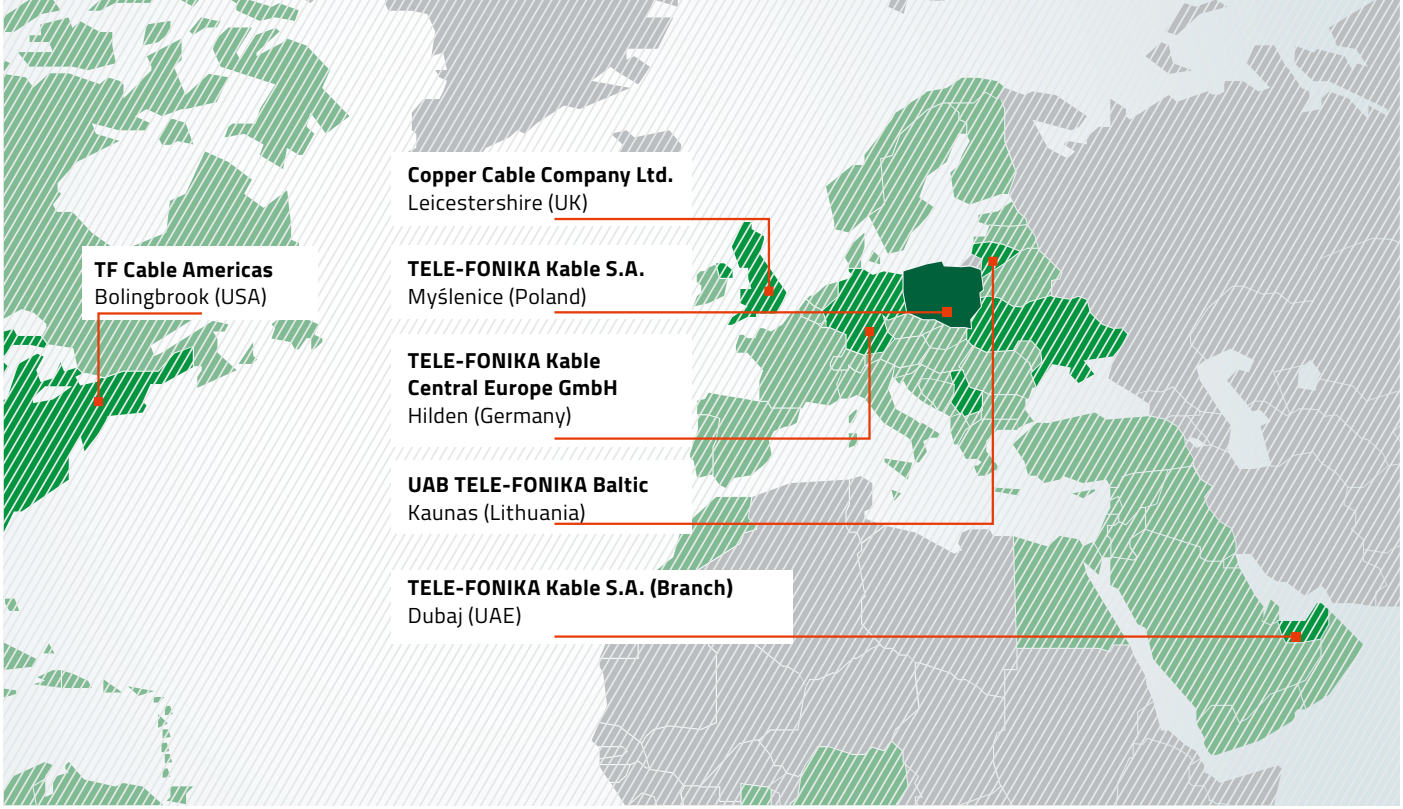
Experience and competence of the TELE-FONIKA Kable Group

The Group TELE-FONIKA Kable (TF Kable) is ranked in the forefront of the global cable industry.

The Group is the fourth manufacturer of cables and wires in Europe with significant development potential, based entirely on Polish capital.

TELE-FONIKA Kable Group's considerable investment in research and development centers and multi-skilled work teams, which have included eminent scientists working with our specialists, has been rewarded by the introduction of new-generation products and comprehensive services in the field of cable engineering. Products manufactured in our plants are sold in over 80 countries.

Our product assortment includes 25 thousand cable types. The highest quality of our products is confirmed by over 380 certificates for groups of wares licensed by 34 renown centres of certifications worldwide. The company combines the good traditions of the cable industry in Poland and innovative technical solutions. TELE-FONIKA Kable Group consists of six plants – four in Poland, one in Ukraine, and one in Serbia. We own over a dozen trade agencies abroad, reaching customers in several dozen countries around the world.



Experience and competence of the TELE-FONIKA Kable Group

Kraków-Wielicka plant – production of PVC or XLPE insulated 1 kV cables with copper or alluminium conductor, screened or armoured types, fire resistant and halogen free cables, overhead conductors as well as rubber insulated and/or rubber sheathed cables with voltage up to 30kV for heavy industry, signaling and control cables for special applications.

Kraków-Bieżanów plant – production of PCV or XLPE insulated copper wires and cables up to 1 kV, halogen free and fire resistant types and copper orsiver-coper overhead conductors for railway traction.

Bydgoszcz plant – the largest in Europe production center of medium, high and extra hight voltage cables with voltage up to 500 kV

Myślenice plant – production copper and fiber optic telecommunication cables, data telecommunication cables and automotive wires

Zajecar plant (Serbia) – production of low and medium voltage cables, signaling and control cables, telecommunication cables, as well as halogen-free cables and wires

Czernihov plant (Ukraine) – production of copper wires and cables up to 1 kV, fire resistant and flame retardant cables as well as insulated overhead aluminum conductors.

Bukowno-Poland plant (recycling of cable waste) – with the recycling capacity of approx. 10 thousand tons of cable waste per year. This allows for the recovery of fractions from individual materials with purity of over 99.5%

Fire Test Laboratory in the Krakow-Wielicka production plant – equipped with special apparatus that enables to provide flame propagation test on bundled cables, smoke density test as well as circuit integrity test with water or mechanical shock, test for corrosive gases emission.

Laboratory of High and Extreme Voltages in the production plant in Bydgoszcz – equipped with 4 Faraday cages and research filed for qualification tests for cables and systems up to 500 kV

Application

						
	Max speed m/min	**Rated Voltage**	**Monospiral Drum**	**Vertical Drum**	**Festoon**	**Chains Cable**
REELFLEX NSHTOÜ -J/O	180	0,6/1kV				
REELFLEX (N)SHTOÜ -J + FO	180	0,6/1kV				
REELFLEX R-(N)TSCGEWÖU	180	3,6/6kV - 12/20kV				
REELFLEX R-(N)TSCGEWÖU + FO	180	3,6/6kV - 12/20kV				
REELFLEX R-(N)TSKCGEWÖU	240	3,6/6kV - 12/20kV				
REELFLEX R-(N)TSKCGEWÖU + FO	240	3,6/6kV - 12/20kV				
VERTICALFLEX (N)SHTOÜ -J/O	180	0,6/1kV				
VERTICALFLEX (N)SHTOÜ -J/O SL	180	0,6/1kV				
FESTOONFLEX (N)GRDGÖU -O/J	240	0,6/1kV				
FESTOONFLEX (N)GRDGCGÖU -J	240	0,6/1kV				
FESTOONFLEX (N)GFLCGÖU -O	180	300/500V				
FESTOONFLEX NGFLGÖU -J/O	180	300/500V				
FESTOONFLEX M(StD)HÖU -J/O	180	0,6/1kV				

MAIN APPLICATION
SUITABLE
NO APPLICATION

Additional parameters

									
	Rated Voltage	**Test Voltage (kV)**	**Max. working temperature On The Conductor (°C)**	**Short Circuit Temperature (°C)**	**Oil Resistance**	**Ozone Resistance**	**UV Resistance**	**Flame resistance**	
REELFLEX NSHTOÜ -J/O	0,6/1kV	Test Voltage (kV)	90	250	√	√	√	PN - EN 60332-1-2:2010 IEC 60332-1-2:2010	
REELFLEX (N)SHTOÜ -J + FO	0,6/1kV	AC/5 min:3 kV	90	250	√	√	√	PN - EN 60332-1-2:2010 IEC 60332-1-2:2010	
REELFLEX R-(N)TSCGEWÖU	3,6/6 kV 6/10 kV 8,7/15 kV 12/20kV	AC/5 min:3 kV	90	250	√	√	√	PN - EN 60332-1-2:2010 IEC 60332-1-2:2010	
REELFLEX R-(N)TSCGEWÖU + FO	3,6/6 kV 6/10 kV 8,7/15 kV 12/20kV	AC/5 min: 3,6/6 Kv -11kV 6/10 kV -17 kV 8,7/15 kV - 24 kV 12/20kV- 29 kV	90	250	√	√	√	PN - EN 60332-1-2:2010 IEC 60332-1-2:2010	
REELFLEX R-(N)TSKCGEWÖU	3,6/6 kV 6/10 kV 8,7/15 kV 12/20kV	AC/5 min: 3,6/6 Kv -11kV 6/10 kV -17 kV 8,7/15 kV - 24 kV 12/20kV- 29 kV	90	250	√	√	√	PN - EN 60332-1-2:2010 IEC 60332-1-2:2010	
REELFLEX R-(N)TSKCGEWÖU + FO	3,6/6 kV 6/10 kV 8,7/15 kV 12/20kV	AC/5 min: 3,6/6 Kv -11kV 6/10 kV -17 kV 8,7/15 kV - 24 kV 12/20kV- 29 kV	90	250	√	√	√	PN - EN 60332-1-2:2010 IEC 60332-1-2:2010	
VERTICALFLEX (N)SHTOÜ -J/O	0,6/1 kV	AC/5 min:3 kV	90	250	√	√	√	PN - EN 60332-1-2:2010 IEC 60332-1-2:2010	
VERTICALFLEX (N)SHTOÜ -J/O SL	0,6/1 kV	AC/5 min:3 kV	90	250	√	√	√	PN - EN 60332-1-2:2010 IEC 60332-1-2:2010	
FESTOONFLEX (N)GRDGÖU -O/J	0,6/1 kV	AC/5 min:3 kV	90	250	√	√	√	PN - EN 60332-1-2:2010 IEC 60332-1-2:2010	
FESTOONFLEX (N)GRDGCGÖU -J	0,6/1 kV	AC/5 min:3 kV	90	250	√	√	√	PN - EN 60332-1-2:2010 IEC 60332-1-2:2010	
FESTOONFLEX (N)GFLCGÖU -O	300/500V	AC/5 min:2,5kV	90	250	√	√	√	PN - EN 60332-1-2:2010 IEC 60332-1-2:2010	
FESTOONFLEX NGFLGÖU -J/O	300/500V	AC/5 min:2,5kV	90	250	√	√	√	PN - EN 60332-1-2:2010 IEC 60332-1-2:2010	
FESTOONFLEX M(StD)HÖU -J/O	0,6/1kV	AC/5 min:2,5 kV	90	250	√	√	√	PN - EN 60332-1-2:2010 IEC 60332-1-2:2010	

180 m/min | MAX +90°C | MIN -25°C | Insulation Pb Free | O_3 | RoHS | UV | CE

REELFLEX NSHTOÜ -J/O

DIN VDE 0250-814, VDE MARKS APPROVAL

Low Voltage Rubber Insulated Flexible Cable

DESIGN FEATURES

Conductors	Annealed flexible stranded tinned copper conductor class 5 acc. to IEC 60228.
Separator	If needed a suitable tape separator between the conductor and insulation.
Insulation	EPDM rubber, halogen-free, lead-free compound, type 3GI3 acc. to DIN VDE 0207/20, developed by TF Kable
Circuit identification	Colour coding of power conductors comply to HD 308, DIN VDE 0293- 308 **-J version:** 3 - core: Green-yellow, blue, brown 4 - core: Green-yellow, brown, black, grey or green-yellow, blue, brown, black 5 - core: Green-yellow, blue, brown black, grey Above 5 cores: Green-yellow, other cores black with white numbering **-O version:** 3 - core: Brown, black, grey or blue, brown, black 4 - core: Blue, brown, black, grey 5 - core: Blue, brown, black, grey, black Above 5 cores: Black with white numbering
Inner sheath	A synthetic thermosetting compound type Gm1b acc. to DIN VDE 0207/21, Black
Anty-torsion braid	Braid of polyamide threads between inner and outer sheath
Outer sheath	Special synthetic thermosetting compound, type 5GM3 acc. to DIN VDE 0207/21, developed by TF Kable, Black

FEATURES

Rated Voltage U_0/U	0,6/1 kV
Max. operating voltage Um	1,2 kV
AC test voltage	3 kV

- Current currying capacity: DIN VDE 0298-4

- Max. conductor operating temperature: +90°C
- Max. conductor temperature during short circuit: +250°C
- Minimum ambient temperature for fixed installation: -40°C
- Minimum ambient temperature for mobile installation: -25°C

- Minimum bending radius acc. to DIN VDE 0298-3:

OD of cable[mm]	>8 ≤ 12	>12≤ 20	>20
Fixed installation	3D	4D	4D
On drums	5D	5D	5D
On deflection pulleys	7,5D	7,5D	7,5D
Moving freely	4D	5D	5D

- Roller bending test
- Reeling test
- Twist limits: 25°/m
- Travel speed up to: 180m/min
- Tensile load: 20N/mm²

- Excellent tear, impact and abrasion resistant outer sheath
- Flame propagation: PN-EN 60332-1-2, IEC 60332-1-2

Oil resistant: PN-EN 60811-404, IEC 60811-404
UV resistant: UL 2556, ISO 4892-2
Ozone resistant: PN-ISO 1431-1

Example of standard sheath marking:
<VDE> TF KABLE 3 CE NSHTOÜ-J 3x10 0,6/1kV year + meter

APPLICATIONS

Flexible cable designed for high mechanical stresses, especially for applications with frequent winding and unwinding with co-occurrent tensile and torsion stress. The cable is used for conveyors, container cranes, harbour cranes, building machinery, handling machines in mining and tunnelling equipment. Usable in wet or dry conditions, in industrial units, in underground and opencast mining, in explosion-risk areas.

Standard length cable packing	500 m on drums. Other forms of packing and delivery are available on request

Number of cores x cross-section	Conductor diameter	Approx. overall diameter	Approx. weight	Max. tensile load
mm²	**mm**	**mm**	**kg/km**	**N**
3x1,5	1,5	11,9	198	90
3x2,5	2,1	13,5	264	150
3x4	2,7	16,9	408	240
3x6	3	17,6	477	360
3x10	4,1	21,6	750	600
3x16	5,1	23,8	992	960
3x25	6,6	28,7	1477	1500
3x35	7,5	32,2	1944	2100
3x50	9,3	38,3	2732	3000
3x70	11,1	42,1	3519	4200
3x95	13	48,8	4682	5700
3x120	14,5	52	5655	7200
3x150	16,2	56,6	6903	9000
3x185	18,3	63,8	8459	11100

Number of cores x cross-section	Conductor diameter	Approx. overall diameter	Approx. weight	Max. tensile load
mm²	**mm**	**mm**	**kg/km**	**N**
3x240	20,7	71,6	11086	14400
4x1,5	1,5	12,7	232	120
4x2,5	2,1	15,7	354	200
4x4	2,7	18,1	484	320
4x6	3	19	572	480
4x10	4,1	23,3	910	800
4x16	5,1	26,8	1278	1280
4x25	6,6	32,6	1923	2000
4x35	7,5	34,9	2405	2800
4x50	9,3	41,5	3385	4000
4x70	11,1	45,8	4393	5600
4x95	13	53,1	5839	7600
4x120	14,5	58,6	7335	9600
4x150	16,2	63,6	8965	12000
4x185	18,3	71,5	10924	14800
5x1,5	1,5	13,6	269	150
5x2,5	2,1	16,8	412	250
5x4	2,7	19,5	570	400
5x6	3	21,3	716	600
5x10	4,1	25,2	1086	1000
5x16	5,1	29	1532	1600
5x25	6,6	35,3	2310	2500
5x35	7,5	39,3	3031	3500
5x50	9,3	45,2	4096	5000
5x70	11,1	51,7	5553	7000
7x1,5	1,5	16,9	405	210
7x2,5	2,1	19,4	549	350
7x4	2,7	23,5	814	560
12x1,5	1,5	22,6	715	360
12x2,5	2,1	26,2	990	600
12x4	2,7	32,1	1490	960
18x1,5	1,5	24,9	882	540
18x2,5	2,1	30,1	1305	900
18x4	2,7	37,1	1984	1440
24x1,5	1,5	25,9	1016	720
24x2,5	2,1	31,3	1511	1200

Number of cores x cross-section	Conductor diameter	Approx. overall diameter	Approx. weight	Max. tensile load
mm²	**mm**	**mm**	**kg/km**	**N**
30x1,5	1,5	29,8	1318	900
30x2,5	2,1	36,3	1980	1500
36x1,5	1,5	32,4	1531	1080
36x2,5	2,1	39,4	2300	1800
42x1,5	1,5	34,8	1777	1260
42x2,5	2,1	42,0	2646	2100
44x1,5	1,5	34,8	1799	1320
44x2,5	2,1	42,0	2679	2200
50x1,5	1,5	36,7	2012	1500
50x2,5	2,1	44,4	3002	2500

POWER CONDUCTOR RESISTANCE

Cross- section	Max. conductor resistance at 20°C Tinned wires
mm²	**Ω/km**
1,5	13,7
2,5	8,21
4	5,09
6	3,39
10	1,95
16	1,24
25	0,795
35	0,565
50	0,393
70	0,277
95	0,21
120	0,164
150	0,132
185	0,108
240	0,0817
300	0,0654
400	0,0495

REELFLEX NSHTOÜ -J
3+3PE symmetric construction

DIN VDE 0250-814, VDE MARKS APPROVAL

Low Voltage Rubber Insulated Flexible Cable

DESIGN FEATURES

Conductors	Annealed flexible stranded tinned copper conductor class 5 acc. to IEC 60228.
Separator	If needed a suitable tape separator between the conductor and insulation.
Insulation	EPDM rubber, halogen-free, lead-free compound, type 3GI3 acc. to DIN VDE 0207/20, developed by TF Kable
Color of insulation*	Colour coding of power conductors compliant to HD 308, DIN VDE 0293- 308 Power cores: 3-core circuit identification: Brown, black, grey Earth cores: Green-yellow
Earth conductor	Tinned or bare copper conductor, rubber insulated
Core arrangement	Three power cores, earth conductor split into 3 parts and placed into the interstices
Inner sheath	A synthetic thermosetting compound type Gm1b acc. to DIN VDE 0207/21, Black
Anty-torsion braid	Braid of polyamide threads between inner and outer sheath
Outer sheath	Special synthetic thermosetting compound, type 5GM3 acc. to DIN VDE 0207/21, developed by TF Kable, Black

* other core identification available on request

FEATURES

Rated Voltage U_0/U	0,6/1 kV
Max. operating voltage Um	1,2 kV
AC test voltage	3 kV

- Current currying capacity: DIN VDE 0298-4

- Max. conductor operating temperature: +90°C
- Max. conductor temperature during short circuit: +250°C
- Minimum ambient temperature for fixed installation: -40°C
- Minimum ambient temperature for mobile installation: -25°C

- Minimum bending radius acc. to DIN VDE 0298-3:

OD of cable[mm]	>8 ≤ 12	>12≤ 20	>20
Fixed installation	3D	4D	4D
On drums	5D	5D	5D
On deflection pulleys	7,5D	7,5D	7,5D
Moving freely	4D	5D	5D

- Roller bending test
- Reeling test
- Twist limits: 25°/m
- Travel speed up to: 180m/min
- Tensile load: 20N/mm²

Oil resistant: PN-EN 60811-404, IEC 60811-404
UV resistant: UL 2556, ISO 4892-2
Ozone resistant: PN-ISO 1431-1
Example of standard sheath marking:
<VDE> TF KABLE 3 CE NSHTOÜ-J
3x70+3x35/3 0,6/1kV year + meter

- Tear, impact and abrasion resistant outer sheath
- Flame propagation: PN-EN 60332-1-2, IEC 60332-1-2

APPLICATIONS

Specially designed flexible cable for power mobile connections, for extremely high mechanical stresses.
The cable is used in cable winding reels winding and unwinding with co-occurrent tensile and torsion stress.
The cable is used for conveyors, container cranes, harbour cranes, building machinery, handling machines.
Usable in wet or dry conditions, in industrial units, in underground and opencast mining, in explosion-risk areas.

Standard length cable packing	500 m on drums. Other forms of packing and delivery are available on request

Number of cores x cross-section	Conductor diameter	Approx. overall diameter	Approx. weight	Max. tensile load
mm²	**mm**	**mm**	**kg/km**	**N**
3x35+3x16/3	7,5	31,2	2073	2100
3x50+3x25/3	9,3	37,3	2935	3000
3x70+3x35/3	11,1	42,1	3911	4200
3x95+3x50/3	13	47,8	5148	5700
3x120+3x70/3	14,5	51,0	6309	7200
3x150+3x70/3	16,2	56,6	7724	9000
3x185+3x95/3	18,3	62,8	9408	11100
3x240+3x120/3	20,7	69,8	12167	14400
3x300+3x150/3	24,2	80,0	15419	18000

POWER CONDUCTOR RESISTANCE

Cross- section	Max. conductor resistance at 20°C Tinned wires
mm²	**Ω/km**
16	1,24
25	0,795
35	0,565
50	0,393
70	0,277
95	0,21
120	0,164
150	0,132
185	0,108
240	0,0817
300	0,0654
400	0,0495

REELFLEX (N)SHTOÜ -J + FO
3+2PE+FO

Based on: DIN VDE 0250-814

Low Voltage Rubber Insulated Flexible Cable with Integrated Fiber-Optics

DESIGN FEATURES

Conductors	Special construction ensuring higher flexibility. Annealed flexible stranded tinned or bare copper conductor class 5 to IEC 60228.
Separator	If needed a suitable tape separator between the conductor and insulation.
Insulation	EPDM rubber, halogen-free, lead-free compound, type 3GI3 acc. to DIN VDE 0207/20, developed by TF Kable
Color of insulation*	Colour coding of power conductors comply to HD 308, DIN VDE 0293- 308 Power cores: 3-core circuit identification: Brown, black, grey Earth cores: Green-yellow
Earth conductor	Tinned or bare copper conductor rubber insulated
Fiber Optic Modulus	A-D(ZN)13Y 6, 12, 18 or 24 fibers G50/125, G62,5/125 or E9/125
Identification of the fibers	Color coded fibres and tubes
Fiber covering	Buffering tube with filling compound
Core arrangement	Three power cores, earth conductor split into 2 parts and FO placed into the interstices
Inner sheath	A special synthetic thermosetting compound type 5GM3 acc. to DIN VDE 0207/21, Yellow
Anty-torsion braid	Braid of polyamide threads between inner and outer sheath
Outer sheath	Special synthetic thermosetting compound, 5GM5 quality acc. to DIN VDE 0207/21 developed by TF Kable, Yellow

* other identification available on request

FEATURES

Rated Voltage U_0/U	0,6/1 kV
Max. operating voltage Um	1,2 kV
AC test voltage	3 kV

- Current currying capacity: DIN VDE 0298-4

- Max. conductor operating temperature: +90°C
- Max. conductor temperature during short circuit: +250°C
- Minimum ambient temperature for fixed installation: -40°C
- Minimum ambient temperature for mobile installation: -25°C

- Minimum bending radius acc. to DIN VDE 0298-3:

OD of cable[mm]	>8 ≤ 12	>12≤ 20	>20
Fixed installation	3D	4D	4D
On drums	5D	5D	5D
On deflection pulleys	7,5D	7,5D	7,5D
Moving freely	4D	5D	5D

- Roller bending test
- Reeling test
- Twist limits: 50°/m
- Travel speed up to: 180m/min
- Tensile load: 20N/mm²

- Excellent tear, impact and abrasion resistant outer sheath
- Flame propagation: PN-EN 60332-1-2, IEC 60332-1-2

Oil resistant: PN-EN 60811-404, IEC 60811-404
UV resistant: UL 2556, ISO 4892-2
Ozone resistant: PN-ISO 1431-1

Example of standard sheath marking:
TF KABLE 3 REELFLEX CE (N)SHTOÜ-J
3x35+2x16/2+FO 0,6/1kV year + meter

APPLICATIONS

Specially designed flexible cable for power mobile connections, for extremely high mechanical stresses.
The cable is used in cable winding reels winding and unwinding with co-occurrent tensile and torsion stress.
The cable is used for conveyors, container cranes, harbour cranes, building machinery, handling machines.
Usable in wet or dry conditions, in industrial units, in underground and opencast mining, in explosion-risk areas.

Standard length cable packing	500 m on drums. Other forms of packing and delivery are available on request

Number of cores x cross-section	Conductor diameter	Approx. overall diameter	Approx. weight	Max. tensile load
mm²	**mm**	**mm**	**kg/km**	**N**
3x35+2x16/2+FO	7,5	41,0	2945	2100
3x50+2x25/2+FO	9,3	41,7	3395	3000
3x70+2x35/2+FO	11,1	45,5	4318	4200
3x95+2x50/2+FO	13	50,4	5473	5700
3x120+2x70/2+FO	14,5	57,2	7131	7200
3x150+2x70/2+FO	16,2	57,4	7849	9000
3x185+2x95/2+FO	18,3	66,8	10006	11100
3x240+2x120/2+FO	20,7	72,8	12649	14400
3x300+2x150/2+FO	24,2	81,7	15382	18000

POWER CONDUCTOR RESISTANCE

Cross- section	Max. conductor resistance at 20°C	
	Plain wires	Tinned wires
mm²	**Ω/km**	**Ω/km**
16	1,21	1,24
25	0,78	0,795
35	0,554	0,565
50	0,386	0,393
70	0,272	0,277
95	0,206	0,21
120	0,161	0,164
150	0,129	0,132
185	0,106	0,108
240	0,0801	0,0817
300	0,0641	0,0654

FIBER DATA

Parameter	G50/125 multimode	G62,5/125 multimode	E9/125 singlemode
Attenuation at 850 nm	≤2.5 dB/km	≤3.0	–
Attenuation at 1300 nm	≤0.6 dB/km	≤1.0	–
Attenuation at 1550 nm	–	–	≤0.21 / ≤0.19 dB/km
Bandwidth at 850 nm	≥700 MHz*km	220 MHz*km	–
Bandwidth at 1300 nm	≥500 MHz*km	500 MHz*km	–
Numerical Aperture at 850 nm	0.200 ±0.010	≤0.275 ±0.015	–
Group refractive index at 850 nm	1.483	1.496	–
Group refractive index at 1300 nm	1.479	1.491	–
Group refractive index at 1550 nm	–	–	1.468

REELFLEX R-(N)TSCGEWÖU

Based on: DIN VDE 0250-813

Medium Voltage Flexible Reeling Cable

DESIGN FEATURES

Conductors	Annealed flexible stranded tinned or bare copper conductor class 5 to IEC 60228. Type of conductor design: opposite-lay with special length of lay.
Separator	Wrap of semi-conductive tape between the power conductor and insulation and between earth conductor and semi-conductive layer
Conductor screen	Semi-conductive layer of special rubber, developed by TF Kable
Insulation	Special EPDM rubber, halogen-free, lead-free compound, exceeding type 3GI3, developed by TF Kable, White
Insulation screen	Semi-conductive, special strippable layer over insulation of power cores. Maximum resistivity of semi-conductive layers -200 [Ω x m]
Earth conductor	Tinned or bare copper conductor class 5 to IEC 60228 with extruded special semi-conductive rubber compound
Core arrangement	Power cores and earth conductor split into 3 parts laid up around conductive filler in the centre. Anty-adhesion graphite over assembled conductors.
Inner sheath	A special synthetic thermosetting compound type 5GM3 acc. to DIN VDE 0207/21, Red
Anty-torsion braid	Braid of polyamide threads between inner and outer sheath
Outer sheath	Special synthetic thermosetting compound, 5GM5 quality acc. to DIN VDE 0207/21 developed by TF Kable, Red

FEATURES

Rated Voltage U_0/U	3,6/6 kV	6/10 kV	8,7/15 kV	12/20 kV
Max. operating voltage Um	7,2 kV	12 kV	18 kV	24 kV
AC test voltage	11 kV	17 kV	24 kV	29 kV

- Partial discharge: $1{,}25U_0$/max 20 pC
- Current currying capacity: DIN VDE 0298-4

- Max. conductor operating temperature: +90°C
- Max. conductor temperature during short circuit: +250°C
- Minimum ambient temperature for fixed installation: -40°C
- Minimum ambient temperature for mobile installation: -25°C

- Minimum bending radius acc. to DIN VDE 0298-3:

Fixed installation	6D
On drums	12D
On deflection pulleys	15D
Moving freely	10D

- Roller bending test
- Reeling test
- Twist limits: 100°/m
- Travel speed up to: 180m/min
- Tensile load: 20N/mm²

- Excellent tear, impact and abrasion resistant outer sheath
- Flame propagation: PN-EN 60332-1-2, IEC 60332-1-2

Oil resistant: PN-EN 60811-404, IEC 60811-404
UV resistant: UL 2556, ISO 4892-2
Ozone resistant: PN-ISO 1431-1

Example of standard sheath marking:
TF KABLE 3 REELFLEX R-(N)TSCGEWÖU
3x50+3x16/3 6/10kV year + meter

APPLICATIONS

Specially designed flexible reeling cable with reduced dimensions for extremely high mechanical stresses occur in applications with mono spiral reels and cylindrical reels, very high reeling speed, torsional stress. Also for connection of large material handling machines such as excavators, dumpers, crushers in opencast mines. Usable in wet or dry conditions, in industrial units, in underground and opencast mining, in explosion-risk areas.

Standard length cable packing	500 m on drums. Other forms of packing and delivery are available on request

Number of cores x cross-section	Conductor diameter	Approx. overall diameter	Approx. weight	Max. tensile load
mm²	**mm**	**mm**	**kg/km**	**N**
3,6/6 kV				
3x25+3x25/3	6,5	39,9	2466	1500
3x35+3x25/3	7,5	42,0	2876	2100
3x50+3x25/3	9,3	45,8	3540	3000
3x70+3x35/3	11,1	51,5	4662	4200
3x95+3x50/3	13	55,6	5731	5700
3x120+3x70/3	14,5	58,8	6886	7200
3x150+3x70/3	16,2	64,3	8320	9000
3x185+3x95/3	18,3	68,8	9738	11100
6/10 kV				
3x25+3x25/3	6,5	41,6	2617	1500
3x35+3x25/3	7,5	43,7	3035	2100
3x50+3x25/3	9,3	47,5	3712	3000
3x70+3x35/3	11,1	53,2	4856	4200
3x95+3x50/3	13	57,3	5940	5700
3x120+3x70/3	14,5	60,6	7106	7200
3x150+3x70/3	16,2	66,0	8560	9000
3x185+3x95/3	18,3	70,5	9993	11100
8,7/15 kV				
3x25+3x25/3	6,5	45,1	2949	1500
3x35+3x25/3	7,5	47,1	3370	2100
3x50+3x25/3	9,3	52,7	4296	3000
3x70+3x35/3	11,1	56,7	5261	4200
3x95+3x50/3	13	60,7	6374	5700
3x120+3x70/3	14,5	65,8	7841	7200
3x150+3x70/3	16,2	69,4	9060	9000
3x185+3x95/3	18,3	75,8	10844	11100

Number of cores x cross-section	Conductor diameter	Approx. overall diameter	Approx. weight	Max. tensile load
mm²	**mm**	**mm**	**kg/km**	**N**
12/20 kV				
3x25+3x25/3	6,5	48,1	3244	1500
3x35+3x25/3	7,5	52,0	3908	2100
3x50+3x25/3	9,3	55,7	4639	3000
3x70+3x35/3	11,1	59,7	5644	4200
3x95+3x50/3	13	65,6	7061	5700
3x120+3x70/3	14,5	68,8	8286	7200
3x150+3x70/3	16,2	72,5	9526	9000

POWER CONDUCTOR RESISTANCE

Cross- section	Max. conductor resistance at 20°C	
	Plain wires	Tinned wires
mm²	**Ω/km**	**Ω/km**
25	0,78	0,795
35	0,554	0,565
50	0,386	0,393
70	0,272	0,277
95	0,206	0,21
120	0,161	0,164
150	0,129	0,132
185	0,106	0,108

REELFLEX R-(N)TSCGEWÖU + FO

Based on: DIN VDE 0250-813

Medium Voltage Flexible Reeling Cable with Integrated Fiber-Optics

DESIGN FEATURES

Conductors	Annealed flexible stranded tinned or bare copper conductor class 5 to IEC 60228. Type of conductor design: opposite-lay with special length of lay.
Separator	Wrap of semi-conductive tape between the power conductor and insulation and between earth conductor and semi-conductive layer
Conductor screen	Semi-conductive layer of special rubber, developed by TF Kable
Insulation	Special EPDM rubber, halogen-free, lead-free compound, exceeding type 3GI3, developed by TF Kable, White
Insulation screen	Semi-conductive, special strippable layer over insulation of power cores. Maximum resistivity of semi-conductive layers -200 [Ω x m]
Earth conductor	Tinned or bare copper conductor class 5 to IEC 60228 with extruded special semiconducting rubber compound
Fiber Optic Modulus	A-D(ZN)13Y 6, 12, 18 or 24 fibers G50/125, G62,5/125 or E9/125
Identification of the fibers	Color coded fibres and tubes
Fiber covering	Buffering tube with filling compound
Core arrangement	Power cores, earth conductor split into 2 parts and FO laid up around conductive filler in the centre. Anty-adhesion graphite over assembled conductors.
Inner sheath	A special synthetic thermosetting compound type 5GM3 acc. to DIN VDE 0207/21, Red

DESIGN FEATURES

Anty-torsion braid	Braid of polyamide threads between inner and outer sheath
Outer sheath	Special synthetic thermosetting compound, 5GM5 quality acc. to DIN VDE 0207/21 developed by TF Kable, Red

FEATURES

Rated Voltage U_0/U	3,6/6 kV	6/10 kV	8,7/15 kV	12/20 kV
Max. operating voltage Um	7,2 kV	12 kV	18 kV	24 kV
AC test voltage	11 kV	17 kV	24 kV	29 kV

- Partial discharge: 1,25U_0/max 20 pC
- Current currying capacity: DIN VDE 0298-4

- Max. conductor operating temperature: +90°C
- Max. conductor temperature during short circuit: +250°C
- Minimum ambient temperature for fixed installation: -40°C
- Minimum ambient temperature for mobile installation: -25°C

- Minimum bending radius acc. to DIN VDE 0298-3:

Fixed installation	6D
On drums	12D
On deflection pulleys	15D
Moving freely	10D

- Roller bending test
- Reeling test
- Twist limits: 100°/m
- Travel speed up to: 180m/min
- Tensile load: 20N/mm²

- Excellent tear, impact and abrasion resistant
- Flame propagation: PN-EN 60332-1-2, IEC 60332-1-2

Oil resistant: PN-EN 60811-404, IEC 60811-404
UV resistant: UL 2556, ISO 4892-2
Ozone resistant: PN-ISO 1431-1

Example of standard sheath marking:
TF KABLE 3 REELFLEX R-(N)TSCGEWÖU
3x35+2x25/2+12FO 6/10kV year + meter

APPLICATIONS

Specially designed flexible reeling cable with reduced dimensions for extremely high mechanical stresses occur in applications with mono spiral reels and cylindrical reels, very high reeling speed, torsional stress. Also for connection of large material handling machines such as excavators, dumpers, crushers in opencast mines. Usable in wet or dry conditions, in industrial units, in underground and opencast mining, in explosion-risk areas.

Standard length cable packing	500 m on drums. Other forms of packing and delivery are available on request

Number of cores x cross-section	Conductor diameter	Approx. overall diameter	Approx. weight	Max. tensile load
mm²	**mm**	**mm**	**kg/km**	**N**
3,6/6 kV				
3x25+2x25/2+FO	6,5	39,9	2479	1500
3x35+2x25/2+FO	7,5	42,0	2882	2100
3x50+2x25/2+FO	9,3	45,8	3534	3000
3x70+2x35/2+FO	11,1	51,5	4653	4200
3x95+2x50/2+FO	13	55,6	5689	5700
3x120+2x70/2+FO	14,5	58,8	6842	7200
3x150+2x70/2+FO	16,2	64,3	8259	9000
3x185+2x95/2+FO	18,3	68,8	9624	11100
6/10 kV				
3x25+2x25/2+FO	6,5	41,6	2624	1500
3x35+2x25/2+FO	7,5	43,7	3035	2100
3x50+2x25/2+FO	9,3	47,5	3699	3000
3x70+2x35/2+FO	11,1	53,2	4840	4200
3x95+2x50/2+FO	13	57,3	5890	5700
3x120+2x70/2+FO	14,5	60,6	7054	7200
3x150+2x70/2+FO	16,2	66,0	8490	9000
3x185+2x95/2+FO	18,3	70,5	9871	11100
8,7/15 kV				
3x25+2x25/2+FO	6,5	45,1	2933	1500
3x35+2x25/2+FO	7,5	47,1	3359	2100
3x50+2x25/2+FO	9,3	52,7	4270	3000
3x70+2x35/2+FO	11,1	56,7	5231	4200
3x95+2x50/2+FO	13	60,7	6309	5700
3x120+2x70/2+FO	14,5	65,8	7772	7200
3x150+2x70/2+FO	16,2	69,4	8971	9000
3x185+2x95/2+FO	18,3	75,8	10702	11100

Number of cores x cross-section	Conductor diameter	Approx. overall diameter	Approx. weight	Max. tensile load
mm²	**mm**	**mm**	**kg/km**	**N**
12/20 kV				
3x25+2x25/2+FO	6,5	48,1	3229	1500
3x35+2x25/2+FO	7,5	52	3885	2100
3x50+2x25/2+FO	9,3	55,7	4600	3000
3x70+2x35/2+FO	11,1	59,7	5584	4200
3x95+2x50/2+FO	13	65,6	6961	5700
3x120+2x70/2+FO	14,5	68,8	8181	7200
3x150+2x70/2+FO	16,2	72,5	9401	9000

POWER CONDUCTOR RESISTANCE

Cross- section	Max. conductor resistance at 20°C	
	Plain wires	Tinned wires
mm²	**Ω/km**	**Ω/km**
25	0,78	0,795
35	0,554	0,565
50	0,386	0,393
70	0,272	0,277
95	0,206	0,21
120	0,161	0,164
150	0,129	0,132
185	0,106	0,108

FIBER DATA

Parameter	G50/125 **multimode**	G62,5/125 **multimode**	E9/125 **singlemode**
Attenuation at 850 nm	≤2.5 dB/km	≤3.0	–
Attenuation at 1300 nm	≤0.6 dB/km	≤1.0	–
Attenuation at 1550 nm	–	–	≤0.21 / ≤0.19 dB/km
Bandwidth at 850 nm	≥700 MHz*km	220 MHz*km	–
Bandwidth at 1300 nm	≥500 MHz*km	500 MHz*km	–
Numerical Aperture at 850 nm	0.200 ±0.010	≤0.275 ±0.015	–
Group refractive index at 850 nm	1.483	1.496	–
Group refractive index at 1300 nm	1.479	1.491	–
Group refractive index at 1550 nm	–	–	1.468

REELFLEX R-(N)TSKCGEWÖU

Based on: DIN VDE 0250-813

Medium Voltage Flexible Reeling Cable with Cradle Separator

DESIGN FEATURES

Conductors	Annealed flexible stranded tinned or bare copper conductor class 5 to IEC 60228. Type of conductor design: opposite-lay with special length of lay.
Separator	Wrap of semi-conductive tape between the power conductor and insulation and between earth conductor and semi-conductive layer
Conductor screen	Semi-conductive layer of special rubber, developed by TF Kable
Insulation	Special EPDM rubber, halogen-free, lead-free compound, exceeding type 3GI3, developed by TF Kable, White
Insulation screen	Semi-conductive, special strippable layer over insulation of power cores. Maximum resistivity of semi-conductive layers -200 [Ω x m]
Earth conductor	Tinned or bare copper conductor class 5 to IEC 60228 with extruded special semi-conductive rubber compound
Core arrangement	Power cores and earth conductor split into 3 parts laid up around semi-conductive cradle separator. Anty-adhesion graphite over assembled conductors.
Inner sheath	A special synthetic thermosetting compound type 5GM3 acc. to DIN VDE 0207/21, Red
Anty-torsion braid	Braid of polyamide threads between inner and outer sheath
Outer sheath	Special synthetic thermosetting compound, 5GM5 quality acc. to DIN VDE 0207/21 developed by TF Kable, Red

FEATURES

Rated Voltage U_0/U	3,6/6 kV	6/10 kV	8,7/15 kV	12/20 kV
Max. operating voltage Um	7,2 kV	12 kV	18 kV	24 kV
AC test voltage	11 kV	17 kV	24 kV	29 kV

- Partial discharge: $1{,}25U_0$/max 20 pC
- Current currying capacity: DIN VDE 0298-4

- Max. conductor operating temperature: +90°C
- Max. conductor temperature during short circuit: +250°C
- Minimum ambient temperature for fixed installation: -40°C
- Minimum ambient temperature for mobile installation: -25°C

- Minimum bending radius acc. to DIN VDE 0298-3:

Fixed installation	6D
On drums	12D
On deflection pulleys	15D
Moving freely	10D

- Roller bending test
- Reeling test
- Twist limits: 25°/m
- Travel speed up to: 240m/min
- Tensile load: 20N/mm²

- Excellent tear, impact and abrasion resistant outer sheath
- Flame propagation: PN-EN 60332-1-2, IEC 60332-1-2

Oil resistant: PN-EN 60811-404, IEC 60811-404
UV resistant: UL 2556, ISO 4892-2
Ozone resistant: PN-ISO 1431-1

Example of standard sheath marking:
TF KABLE 3 REELFLEX R-(N)TSKCGEWÖU
3x50+3x25/3 6/10kV year + meter

APPLICATIONS

Specially designed flexible reeling cable with reduced dimensions for high mechanical stresses occur in applications with mono spiral reels and cylindrical reels, extreme high reeling speed, torsional stress. Also for connection of large material handling machines such as excavators, dumpers, crushers in opencast mines. Usable in wet or dry conditions, in industrial units, in underground and opencast mining, in explosion-risk areas.

Standard length cable packing	500 m on drums. Other forms of packing and delivery are available on request

Number of cores x cross-section	Conductor diameter	Approx. overall diameter	Approx. weight	Max. tensile load
mm²	**mm**	**mm**	**kg/km**	**N**
3,6/6 kV				
3x25+3x25/3	6,5	41,6	2552	1500
3x35+3x25/3	7,5	43,7	2957	2100
3x50+3x25/3	9,3	48,1	3644	3000
3x70+3x35/3	11,1	53,8	4793	4200
3x95+3x50/3	13	57,9	5879	5700
3x120+3x70/3	14,5	63,5	7328	7200
3x150+3x70/3	16,2	67,2	8527	9000
3x185+3x95/3	18,3	71,7	9948	11100
6/10 kV				
3x25+3x25/3	6,5	43,4	2696	1500
3x35+3x25/3	7,5	45,4	3122	2100
3x50+3x25/3	9,3	51,6	4039	3000
3x70+3x35/3	11,1	55,5	4992	4200
3x95+3x50/3	13	59,6	6078	5700
3x120+3x70/3	14,5	65,2	7564	7200
3x150+3x70/3	16,2	68,9	8777	9000
3x185+3x95/3	18,3	75,2	10532	11100
8,7/15 kV				
3x25+3x25/3	6,5	46,8	3028	1500
3x35+3x25/3	7,5	48,9	3454	2100
3x50+3x25/3	9,3	55	4430	3000
3x70+3x35/3	11,1	59	5414	4200
3x95+3x50/3	13	64,9	6801	5700
3x120+3x70/3	14,5	68,7	8054	7200
3x150+3x70/3	16,2	72,3	9273	9000
3x185+3x95/3	18,3	78,7	11074	11100

Number of cores x cross-section	Conductor diameter	Approx. overall diameter	Approx. weight	Max. tensile load
mm²	**mm**	**mm**	**kg/km**	**N**
12/20 kV				
3x25+3x25/3	6,5	51,6	3548	1500
3x35+3x25/3	7,5	53,7	4010	2100
3x50+3x25/3	9,3	58,1	4785	3000
3x70+3x35/3	11,1	63,8	6062	4200
3x95+3x50/3	13	67,9	7218	5700
3x120+3x70/3	14,5	71,7	8493	7200
3x150+3x70/3	16,2	77,1	10060	9000

POWER CONDUCTOR RESISTANCE

Cross- section	Max. conductor resistance at 20˚C	
	Plain wires	Tinned wires
mm²	**Ω/km**	**Ω/km**
25	0,78	0,795
35	0,554	0,565
50	0,386	0,393
70	0,272	0,277
95	0,206	0,21
120	0,161	0,164
150	0,129	0,132
185	0,106	0,108

REELFLEX R-(N)TSKCGEWÖU + FO

Based on: DIN VDE 0250-813

Medium Voltage Flexible Reeling Cable with Cradle Separator and Integrated Fiber-Optics

DESIGN FEATURES

Conductors	Annealed flexible stranded tinned or bare copper conductor class 5 to IEC 60228. Type of conductor design: opposite-lay with special length of lay.
Separator	Wrap of semi-conductive tape between the power conductor and insulation and between earth conductor and semi-conductive layer
Conductor screen	Semi-conductive layer of special rubber, developed by TF Kable
Insulation	Special EPDM rubber, halogen-free, lead-free compound, exceeding type 3GI3, developed by TF Kable, White
Insulation screen	Semi-conductive, special strippable layer over insulation of power cores. Maximum resistivity of semi-conductive layers -200 [Ω x m]
Earth conductor	Tinned or bare copper conductor class 5 to IEC 60228 with extruded special semi-conductive rubber compound
Fiber Optic Modulus	A-D(ZN)13Y 6, 12, 18 or 24 fibers G50/125, G62,5/125 or E9/125
Identification of the fibers	Color coded fibres and tubes
Fiber covering	Buffering tube with filling compound
Core arrangement	Power cores, earth conductor split into 2 parts, and FO laid up around semi-conductive cradle separator. Anty-adhesion graphite over assembled conductors.
Inner sheath	A special synthetic thermosetting compound type 5GM3 acc. to DIN VDE 0207/21, Red
Anty-torsion braid	Braid of polyamide threads between inner and outer sheath
Outer sheath	Special synthetic thermosetting compound, 5GM5 quality acc. to DIN VDE 0207/21 developed by TF Kable, Red

FEATURES

Rated Voltage U_0/U	3,6/6 kV	6/10 kV	8,7/15 kV	12/20 kV
Max. operating voltage Um	7,2 kV	12 kV	18 kV	24 kV
AC test voltage	11 kV	17 kV	24 kV	29 kV

- Partial discharge: $1{,}25U_0$/max 20 pC
- Current currying capacity: DIN VDE 0298-4

- Max. conductor operating temperature: +90°C
- Max. conductor temperature during short circuit: +250°C
- Minimum ambient temperature for fixed installation: -40°C
- Minimum ambient temperature for mobile installation: -25°C

- Minimum bending radius acc. to DIN VDE 0298-3:

Fixed installation	6D
On drums	12D
On deflection pulleys	15D
Moving freely	10D

- Roller bending test
- Reeling test
- Twist limits: 25°/m
- Travel speed up to: 240m/min
- Tensile load: 20N/mm²

- Excellent tear, impact and abrasion resistant outer sheath
- Flame propagation: PN-EN 60332-1-2, IEC 60332-1-2

Oil resistant: PN-EN 60811-404, IEC 60811-404
UV resistant: UL 2556, ISO 4892-2
Ozone resistant: PN-ISO 1431-1

Example of standard sheath marking:
TF KABLE 3 REELFLEX R-(N)TSKCGEWÖU
3x50+2x25/2+FO 6/10kV year + meter

APPLICATIONS

Specially designed flexible reeling cable with reduced dimensions for high mechanical stresses occur in applications with mono spiral reels and cylindrical reels, extreme high reeling speed, torsional stress. Also for connection of large material handling machines such as excavators, dumpers, crushers in opencast mines. Usable in wet or dry conditions, in industrial units, in underground and opencast mining, in explosion-risk areas.

Standard length cable packing	500 m on drums. Other forms of packing and delivery are available on request

Number of cores x cross-section	Conductor diameter	Approx. overall diameter	Approx. weight	Max. tensile load
mm²	**mm**	**mm**	**kg/km**	**N**
3,6/6 kV				
3x25+2x25/2+FO	6,5	41,6	2542	1500
3x35+2x25/2+FO	7,5	43,7	2951	2100
3x50+2x25/2+FO	9,3	48,1	3623	3000
3x70+2x35/2+FO	11,1	53,8	4765	4200
3x95+2x50/2+FO	13	57,9	5798	5700
3x120+2x70/2+FO	14,5	63,5	7258	7200
3x150+2x70/2+FO	16,2	67,2	8416	9000
3x185+2x95/2+FO	18,3	71,7	9800	11100
6/10 kV				
3x25+2x25/2+FO	6,5	43,4	2692	1500
3x35+2x25/2+FO	7,5	45,4	3109	2100
3x50+2x25/2+FO	9,3	51,6	4010	3000
3x70+2x35/2+FO	11,1	55,5	4941	4200
3x95+2x50/2+FO	13	59,6	6004	5700
3x120+2x70/2+FO	14,5	65,2	7485	7200
3x150+2x70/2+FO	16,2	68,9	8655	9000
3x185+2x95/2+FO	18,3	75,2	10372	11100
8,7/15 kV				
3x25+2x25/2+FO	6,5	46,8	3009	1500
3x35+2x25/2+FO	7,5	48,9	3427	2100
3x50+2x25/2+FO	9,3	55,0	4385	3000
3x70+2x35/2+FO	11,1	59,0	5343	4200
3x95+2x50/2+FO	13	64,9	6708	5700
3x120+2x70/2+FO	14,5	68,7	7934	7200
3x150+2x70/2+FO	16,2	72,3	9150	9000
3x185+2x95/2+FO	18,3	78,7	10913	11100
12/20 kV				
3x25+2x25/2+FO	6,5	51,6	3516	1500
3x35+2x25/2+FO	7,5	53,7	3968	2100
3x50+2x25/2+FO	9,3	58,1	4724	3000
3x70+2x35/2+FO	11,1	63,8	5974	4200
3x95+2x50/2+FO	13	67,9	7109	5700
3x120+2x70/2+FO	14,5	71,7	8375	7200
3x150+2x70/2+FO	16,2	77,1	9916	9000

POWER CONDUCTOR RESISTANCE

Cross- section	Max. conductor resistance at 20°C	
	Plain wires	Tinned wires
mm²	**Ω/km**	**Ω/km**
25	0,78	0,795
35	0,554	0,565
50	0,386	0,393
70	0,272	0,277
95	0,206	0,21
120	0,161	0,164
150	0,129	0,132
185	0,106	0,108

FIBER DATA

Parameter	G50/125 **multimode**	G62,5/125 **multimode**	E9/125 **singlemode**
Attenuation at 850 nm	≤2.5 dB/km	≤3.0	–
Attenuation at 1300 nm	≤0.6 dB/km	≤1.0	–
Attenuation at 1550 nm	–	–	≤0.21 / ≤0.19 dB/km
Bandwidth at 850 nm	≥700 MHz*km	220 MHz*km	–
Bandwidth at 1300 nm	≥500 MHz*km	500 MHz*km	–
Numerical Aperture at 850 nm	0.200 ±0.010	≤0.275 ±0.015	–
Group refractive index at 850 nm	1.483	1.496	–
Group refractive index at 1300 nm	1.479	1.491	–
Group refractive index at 1550 nm	–	–	1.468

VERTICALFLEX (N)SHTOÜ -J/O

FOR POWER MOBILE CONNECTION

Based on: DIN VDE 0250-814

Low Voltage Rubber Insulated Flexible Cable

DESIGN FEATURES

Conductors	Special construction with optimized lay length. Annealed flexible stranded tinned or bare copper conductor class 5 to IEC 60228.
Separator	If needed a suitable tape separator between the conductor and insulation.
Insulation	EPDM rubber, halogen-free, lead-free compound, type 3GI3 acc. to DIN VDE 0207/20, developed by TF Kable
Circuit identification	Colour coding of power conductors comply to HD 308, DIN VDE 0293- 308 **-J version:** 3 - core: Green-yellow, blue, brown 4 - core: Green-yellow, brown, black, grey or green-yellow, blue, brown, black 5 - core: Green-yellow, blue, brown, black, grey **-O version:** 3 - core: Brown, black, grey or blue, brown, black 4 - core: Blue, brown, black, grey 5 - core: Blue, brown, black, grey, black
Inner sheath	A special synthetic thermosetting compound type 5GM3 acc. to DIN VDE 0207/21, Yellow
Anty-torsion braid	Braid of polyamide threads between inner and outer sheath
Outer sheath	Special synthetic thermosetting compound, 5GM5 quality acc. to DIN VDE 0207/21 developed by TF Kable, Yellow

FEATURES

Rated Voltage U_0/U	0,6/1 kV
Max. operating voltage Um	1,2 kV
AC test voltage	3 kV

- Current currying capacity: DIN VDE 0298-4

- Max. conductor operating temperature: +90°C
- Max. conductor temperature during short circuit: +250°C
- Minimum ambient temperature for fixed installation: -40°C
- Minimum ambient temperature for mobile installation: -25°C

- Minimum bending radius acc. to DIN VDE 0298-3:

OD of cable[mm]	>8 ≤ 12	>12≤ 20	>20
Fixed installation	3D	4D	4D
On drums	5D	5D	5D
On deflection pulleys	7,5D	7,5D	7,5D
Moving freely	4D	5D	5D

- Roller bending test
- Reeling test
- Twist limits: 50°/m
- Travel speed up to: 180m/min
- Tensile load: 20N/mm²

- Excellent tear, impact and abrasion resistant outer sheath
- Flame propagation: PN-EN 60332-1-2, IEC 60332-1-2

Oil resistant: PN-EN 60811-404, IEC 60811-404
UV resistant: UL 2556, ISO 4892-2
Ozone resistant: PN-ISO 1431-1

Example of standard sheath marking:
TF KABLE 3 VERTICALFLEX CE (N)SHTOÜ-J
3x35 0,6/1kV year + mete

APPLICATIONS

Specially designed flexible cable for power mobile connections, for extremely high mechanical stresses. The cable is used in cable winding reels winding and unwinding with co-occurrent tensile and torsion stress. The cable is used for conveyors, container cranes, harbour cranes, building machinery, handling machines for vertical reeling applications.
Usable in wet or dry conditions, in industrial units, in underground and opencast mining, in explosion-risk areas.

Standard length cable packing	500 m on drums. Other forms of packing and delivery are available on request

Number of cores x cross-section	Conductor diameter	Approx. overall diameter	Approx. weight	Max. tensile load
mm²	**mm**	**mm**	**kg/km**	**N**
3x1,5	1,5	11,9	202	90
3x2,5	2,1	13,5	268	150
3x4	2,7	16,9	416	240
3x6	3	17,6	485	360
3x10	4,1	21,6	762	600
3x16	5,1	23,8	1007	960
3x25	6,6	28,7	1499	1500
3x35	7,5	32,2	1972	2100
3x50	9,3	38,3	2770	3000
3x70	11,1	42,1	3565	4200
3x95	13	48,8	4746	5700
3x120	14,5	52,0	5728	7200
3x150	16,2	56,6	6989	9000
3x185	18,3	63,8	8570	11100
3x240	20,7	71,6	11227	14400
4x1,5	1,5	12,7	239	120
4x2,5	2,1	15,7	365	200
4x4	2,7	18,1	500	320
4x6	3	19,0	590	480
4x10	4,1	23,3	937	800
4x16	5,1	26,8	1315	1280
4x25	6,6	32,6	1976	2000
4x35	7,5	34,9	2468	2800
4x50	9,3	41,5	3475	4000
4x70	11,1	45,8	4508	5600
4x95	13	53,1	5993	7600
4x120	14,5	58,6	7521	9600
4x150	16,2	63,6	9191	12000
4x185	18,3	71,5	11209	14800
5x1,5	1,5	13,6	283	150
5x2,5	2,1	16,8	432	250
5x4	2,7	19,5	600	400
5x6	3	21,3	750	600

Number of cores x cross-section	Conductor diameter	Approx. overall diameter	Approx. weight	Max. tensile load
mm²	**mm**	**mm**	**kg/km**	**N**
5x10	4,1	25,2	1141	1000
5x16	5,1	29,0	1605	1600
5x25	6,6	35,3	2420	2500
5x35	7,5	39,3	3166	3500
5x50	9,3	45,2	4286	5000
5x70	11,1	51,7	5799	7000

POWER CONDUCTOR RESISTANCE

Cross- section	Max. conductor resistance at 20°C	
	Plain wires	Tinned wires
mm²	**Ω/km**	**Ω/km**
1,5	13,3	13,7
2,5	7,98	8,21
4	4,95	5,09
6	3,3	3,39
10	1,91	1,95
16	1,21	1,24
25	0,78	0,795
35	0,554	0,565
50	0,386	0,393
70	0,272	0,277
95	0,206	0,21
120	0,161	0,164
150	0,129	0,132
185	0,106	0,108
240	0,0801	0,0817

VERTICALFLEX (N)SHTOÜ -J
3+3PE symmetric construction

Based on: DIN VDE 0250-814

Low Voltage Rubber Insulated Flexible Cable

DESIGN FEATURES

Conductors	Special construction with optimized lay length. Annealed flexible stranded tinned or bare copper conductor class 5 to IEC 60228.
Separator	If needed a suitable tape separator between the conductor and insulation.
Insulation	EPDM rubber, halogen-free, lead-free compound, type 3GI3 acc. to DIN VDE 0207/20, developed by TF Kable
Color of insulation*	Colour coding of power conductors comply to HD 308, DIN VDE 0293- 308 Power cores: 3-core circuit identification: Brown, black, grey Earth cores: Green-yellow
Earth conductor	Tinned or bare copper conductor rubber insulated
Core arrangement	Three power cores, earth conductor split into 3 parts and placed into the interstices.
Inner sheath	A special synthetic thermosetting compound type 5GM3 acc. to DIN VDE 0207/21, Yellow
Anty-torsion braid	Braid of polyamide threads between internal and outer layer of sheath
Outer layer of sheath	Special synthetic thermosetting compound, 5GM5 quality acc. to DIN VDE 0207/21 developed by TF Kable , Yellow

FEATURES

Rated Voltage U_0/U	0,6/1 kV
Max. operating voltage Um	1,2 kV
AC test voltage	3 kV

- Current currying capacity: DIN VDE 0298-4

- Max. conductor operating temperature: +90°C
- Max. conductor temperature during short circuit: +250°C
- Minimum ambient temperature for fixed installation: -40°C
- Minimum ambient temperature for mobile installation: -25°C

- Minimum bending radius acc. to DIN VDE 0298-3:

OD of cable[mm]	>8 ≤ 12	>12≤ 20	>20
Fixed installation	3D	4D	4D
On drums	5D	5D	5D
On deflection pulleys	7,5D	7,5D	7,5D
Moving freely	4D	5D	5D

- Roller bending test
- Reeling test
- Twist limits: 50°/m
- Travel speed up to: 180m/min
- Tensile load: 20N/mm^2

- Excellent tear, impact and abrasion resistant outer sheath
- Flame propagation: PN-EN 60332-1-2, IEC 60332-1-2

Oil resistant: PN-EN 60811-404, IEC 60811-404
UV resistant: UL 2556, ISO 4892-2
Ozone resistant: PN-ISO 1431-1

Example of standard sheath marking:
TF KABLE 3 VERTICALFLEX CE (N)SHTOÜ-J
3x35+3x16/3 0,6/1kV year + meter

APPLICATIONS

Specially designed flexible cable for power mobile connections, for extremely high mechanical stresses. The cable is used in cable winding reels winding and unwinding with co-occurrent tensile and torsion stress. The cable is used for conveyors, container cranes, harbour cranes, building machinery, handling machines for vertical reeling applications.
Usable in wet or dry conditions, in industrial units, in underground and opencast mining, in explosion-risk areas.

Standard length cable packing	500 m on drums. Other forms of packing and delivery are available on request

Number of cores x cross-section	Conductor diameter	Approx. overall diameter	Approx. weight	Max. tensile load
mm²	**mm**	**mm**	**kg/km**	**N**
3x35+3x16/3	7,5	31,2	2098	2100
3x50+3x25/3	9,3	37,3	2970	3000
3x70+3x35/3	11,1	42,1	3954	4200
3x95+3x50/3	13	47,8	5206	5700
3x120+3x70/3	14,5	51,0	6376	7200
3x150+3x70/3	16,2	56,6	7802	9000
3x185+3x95/3	18,3	62,8	9510	11100
3x240+3x120/3	20,7	69,8	12288	14400
3x300+3x150/3	24,2	80,0	15579	18000

POWER CONDUCTOR RESISTANCE

Cross- section	Max. conductor resistance at 20°C	
	Plain wires	Tinned wires
mm²	**Ω/km**	**Ω/km**
16	1,21	1,24
25	0,78	0,795
35	0,554	0,565
50	0,386	0,393
70	0,272	0,277
95	0,206	0,21
120	0,161	0,164
150	0,129	0,132
185	0,106	0,108
240	0,0801	0,0817
300	0,0641	0,0654

VERTICALFLEX (N)SHTOÜ -J/O SL

FOR SIGNALLING MOBILE CONNECTION

Based on: DIN VDE 0250-814

Low Voltage Rubber Insulated Flexible Cable

DESIGN FEATURES

Conductors	Special construction with optimized lay length. Annealed flexible stranded tinned or bare copper conductor class 5 to IEC 60228.
Separator	If needed a suitable tape separator between the conductor and insulation.
Insulation	EPDM rubber, halogen-free, lead-free compound, type 3GI3 acc. to DIN VDE 0207/20, developed by TF Kable
Circuit identification	Colour coding of power conductors comply to HD 308, DIN VDE 0293- 308 **J- version** Above 5 cores: Green-yellow, other cores black with white numbering **O-version:** Above 5 cores: Black with white numbering
Inner sheath	A special synthetic thermosetting compound type 5GM3 acc. to DIN VDE 0207/21, Yellow
Anty-torsion braid	Braid of polyamide threads between inner and outer sheath
Outer sheath	Special synthetic thermosetting compound, 5GM5 quality acc. to DIN VDE 0207/21 developed by TF Kable, Yellow

FEATURES

Rated Voltage U_0/U	0,6/1 kV
Max. operating voltage Um	1,2 kV
AC test voltage	3 kV

- Current currying capacity: DIN VDE 0298-4

- Max. conductor operating temperature: +90°C
- Max. conductor temperature during short circuit: +250°C
- Minimum ambient temperature for fixed installation: -40°C
- Minimum ambient temperature for mobile installation: -25°C

- Minimum bending radius acc. to DIN VDE 0298-3:

OD of cable[mm]	>8 ≤ 12	>12≤ 20	>20
Fixed installation	3D	4D	4D
On drums	5D	5D	5D
On deflection pulleys	7,5D	7,5D	7,5D
Moving freely	4D	5D	5D

- Roller bending test
- Reeling test
- Twist limits: 50°/m
- Travel speed up to: 180m/min
- Tensile load: 20N/mm²

- Excellent tear, impact and abrasion resistant outer sheath
- Flame propagation: PN-EN 60332-1-2, IEC 60332-1-2

Oil resistant: PN-EN 60811-404, IEC 60811-404
UV resistant: UL 2556, ISO 4892-2
Ozone resistant: PN-ISO 1431-1

Example of standard sheath marking:
TF KABLE 3 VERTICALFLEX CE (N)SHTOÜ-J
7x2,5 0,6/1kV year + meter

APPLICATIONS

Specially designed flexible cable for signalling mobile connections, for extremely high mechanical stresses.
The cable is used in cable winding reels winding and unwinding with co-occurrent tensile and torsion stress.
The cable is used for conveyors, container cranes, harbour cranes, building machinery, handling machines for vertical reeling applications.
Usable in wet or dry conditions, in industrial units, in underground and opencast mining, in explosion-risk areas.

Standard length cable packing	500 m on drums. Other forms of packing and delivery are available on request

Number of cores x cross-section	Conductor diameter	Approx. overall diameter	Approx. weight	Max. tensile load
mm²	**mm**	**mm**	**kg/km**	**N**
7x1,5	1,5	16,9	410	210
7x2,5	2,1	19,4	556	350
12x1,5	1,5	22,6	724	360
12x2,5	2,1	26,2	1002	600
18x1,5	1,5	24,9	893	540
18x2,5	2,1	30,1	1320	900
24x1,5	1,5	25,9	1028	720
24x2,5	2,1	31,3	1527	1200
30x1,5	1,5	29,8	1333	900
30x2,5	2,1	36,3	2000	1500
36x1,5	1,5	32,4	1547	1080
36x2,5	2,1	39,4	2322	1800
42x1,5	1,5	34,8	1795	1260
42x2,5	2,1	42,0	2671	2100
44x1,5	1,5	34,8	1817	1320
44x2,5	2,1	42,0	2706	2200
50x1,5	1,5	36,7	2032	1500
50x2,5	2,1	44,4	3030	2500

POWER CONDUCTOR RESISTANCE

Cross- section	Max. conductor resistance at 20°C	
	Plain wires	Tinned wires
mm²	**Ω/km**	**Ω/km**
1,5	13,3	13,7
2,5	7,98	8,21

FESTOONFLEX (N)GRDGÖU -J/O

Based on: DIN VDE 0250-814

Low Voltage Rubber Insulated Flexible Cable

DESIGN FEATURES

Conductors	Annealed flexible stranded bare or tinned copper conductor class 5 acc. to IEC 60228.
Separator	If needed a suitable tape separator between the conductor and insulation.
Insulation	EPDM rubber, halogen-free, lead-free compound, type 3GI3 acc. to DIN VDE 0207/20, developed by TF Kable
Circuit identification	Colour coding of power conductors comply to HD 308, DIN VDE 0293- 308 **-J version:** 3 - core: Green-yellow, blue, brown 4 - core: Green-yellow, brown, black, grey or green-yellow, blue, brown, black 5 - core: Green-yellow, blue, brown black, grey Above 5 cores: Green-yellow, other cores black with white numbering **-O version:** 3 - core: Brown, black, grey or blue, brown, black 4 - core: Blue, brown, black, grey 5 - core: Blue, brown, black, grey, black Above 5 cores: Black with white numbering
Inner sheath	A synthetic thermosetting compound type Gm1b acc. to DIN VDE 0207/21, Black
Outer sheath	Synthetic thermosetting compound, type 5GM3 acc. to DIN VDE 0207/21 developed by TF Kable, Black

FEATURES

Rated Voltage U_0/U	0,6/1kV
Max. operating voltage Um	1,2 kV
AC test voltage	3 kV

- Current currying capacity: DIN VDE 0298-4
- Max. conductor operating temperature: +90°C

- Max. conductor temperature during short circuit: +250°C
- Minimum ambient temperature for fixed installation: -40°C
- Minimum ambient temperature for mobile installation: -25°C

- Minimum bending radius acc. to DIN VDE 0298-3:

OD of cable[mm]	>8 ≤ 12	>12≤ 20	>20
Fixed installation	3D	4D	4D
On drums	5D	5D	5D
On deflection pulleys	7,5D	7,5D	7,5D
Moving freely	4D	5D	5D

- Roller bending test
- Reeling test
- Twist limits: 25°/m
- Travel speed up to: 240m/min
- Tensile load: 15N/mm²

- Tear, impact and abrasion resistant outer sheath
- Flame propagation: PN-EN 60332-1-2, IEC 60332-1-2

Oil resistant: PN-EN 60811-404, IEC 60811-404
UV resistant: UL 2556, ISO 4892-2
Ozone resistant: PN-ISO 1431-1

Example of standard sheath marking:
TF KABLE 3 CE FESTOONFLEX
(N)GRDGÖU-J 4x10 0,6/1kV year + mete

APPLICATIONS

Flexible cable designed for high mechanical stresses, especially for applications with frequent bending . For festooning systems and connecting moveable parts of container cranes, industrial units, material handling equipment. Usable in wet or dry conditions, outdoors, indoors.

Standard length cable packing	500 m on drums. Other forms of packing and delivery are available on request

Number of cores x cross-section	Conductor diameter	Approx. overall diameter	Approx. weight	Max. tensile load
mm²	**mm**	**mm**	**kg/km**	**N**
1x25	6,6	12,7	349	375
1x35	7,5	13,7	449	525
1x50	9,3	15,9	615	750
1x70	11,1	18,0	835	1050
1x95	13	20,3	1079	1425
1x120	14,5	22,2	1359	1800
1x150	16,2	24,3	1687	2250
1x185	18,3	27,6	2054	2775
4x4	2,7	16,9	423	240
4x6	3	17,7	508	360

Number of cores x cross-section	Conductor diameter	Approx. overall diameter	Approx. weight	Max. tensile load
mm²	**mm**	**mm**	**kg/km**	**N**
4x10	4,1	22,0	827	600
4x16	5,1	25,3	1169	960
4x25	6,6	30,9	1773	1500
4x35	7,5	33,2	2244	2100
4x50	9,3	39,7	3170	3000
5x4	2,7	18,2	515	300
5x6	3	19,9	654	450
5x10	4,1	23,9	1017	750
5x16	5,1	27,4	1444	1200
12x1,5	1,5	21,8	621	270
12x2,5	2,1	25,4	876	450
18x1,5	1,5	24,1	786	405
18x2,5	2,1	29,1	1165	675
24x1,5	1,5	25,1	945	540
24x2,5	2,1	30,3	1406	900
30x1,5	1,5	28,8	1196	675
30x2,5	2,1	35,1	1799	1125
36x1,5	1,5	31,4	1387	810
36x2,5	2,1	38,2	2094	1350

POWER CONDUCTOR RESISTANCE

Cross- section	Max. conductor resistance at 20°C	
	Plain wires	Tinned wires
mm²	**Ω/km**	**Ω/km**
1,5	13,3	13,7
2,5	7,98	8,21
4	4,95	5,09
6	3,3	3,39
10	1,91	1,95
16	1,21	1,24
25	0,78	0,795
35	0,554	0,565
50	0,386	0,393
70	0,272	0,277
95	0,206	0,21
120	0,161	0,164
150	0,129	0,132
185	0,106	0,108

FESTOONFLEX (N)GRDGÖU -J
3+3PE symmetric construction

Based on: DIN VDE 0250-814

Low Voltage Rubber Insulated Flexible Cable

DESIGN FEATURES

Conductors	Annealed flexible stranded bare or tinned copper conductor class 5 acc. to IEC 60228.
Separator	If needed a suitable tape separator between the conductor and insulation.
Insulation	EPDM rubber, halogen-free, lead-free compound, type 3GI3 acc. to DIN VDE 0207/20, developed by TF Kable
Color of insulation*	Colour coding of power conductors comply to HD 308, DIN VDE 0293- 308 Power cores: 3-core circuit identification: Brown, black, grey Earth cores: Green-yellow
Earth conductor	Tinned or bare copper conductor rubber insulated
Core arrangement	Three power cores, earth conductor split into 3 parts and laid up around rubber filler in the centre.
Inner sheath	A synthetic thermosetting compound type Gm1b acc. to DIN VDE 0207/21, Black
Outer sheath	Synthetic thermosetting compound, type 5GM3 acc. to DIN VDE 0207/21 developed by TF Kable, Black

* other core identification available on request

FEATURES

Rated Voltage U_0/U	0,6/1kV
Max. operating voltage Um	1,2 kV
AC test voltage	3 kV

- Current currying capacity: DIN VDE 0298-4

- Max. conductor operating temperature: +90°C
- Max. conductor temperature during short circuit: +250°C
- Minimum ambient temperature for fixed installation: -40°C
- Minimum ambient temperature for mobile installation: -25°C

- Minimum bending radius acc. to DIN VDE 0298-3:

OD of cable[mm]	>8 ≤ 12	>12≤ 20	>20
Fixed installation	3D	4D	4D
On drums	5D	5D	5D
On deflection pulleys	7,5D	7,5D	7,5D
Moving freely	4D	5D	5D

- Roller bending test
- Reeling test
- Twist limits: 25°/m
- Travel speed up to: 240m/min
- Tensile load: 15N/mm²

- Tear, impact and abrasion resistant outer sheath
- Flame propagation: PN-EN 60332-1-2, IEC 60332-1-2

Oil resistant: PN-EN 60811-404, IEC 60811-404
UV resistant: UL 2556, ISO 4892-2
Ozone resistant: PN-ISO 1431-1

Example of standard sheath marking:
TF KABLE 3 CE FESTOONFLEX (N)GRDGÖU-J
3x70+3x50/3 0,6/1kV year + meter

APPLICATIONS

Flexible cable designed for high mechanical stresses, especially for applications with frequent bending .
For festooning systems and connecting moveable parts of container cranes, industrial units, material handling equipment. Usable in wet or dry conditions, outdoors, indoors.

Standard length cable packing	500 m on drums. Other forms of packing and delivery are available on request

Number of cores x cross-section	Conductor diameter	Approx. overall diameter	Approx. weight	Max. tensile load
mm²	**mm**	**mm**	**kg/km**	**N**
3x35+3x16/3	7,5	29,4	1878	1575
3x50+3x25/3	9,3	35,2	2674	2250
3x70+3x35/3	11,1	40,2	3624	3150

POWER CONDUCTOR RESISTANCE

Cross- section	Max. conductor resistance at 20°C	
	Plain wires	Tinned wires
mm²	**Ω/km**	**Ω/km**
16	1,21	1,24
25	0,78	0,795
35	0,554	0,565
50	0,386	0,393
70	0,272	0,277

FESTOONFLEX (N)GRDGCGÖU -J

Based on: DIN VDE 0250-814

Low Voltage Screened Rubber Insulated Flexible Cable

DESIGN FEATURES

Conductors	Annealed flexible stranded bare copper conductor class 5 acc. to IEC 60228.
Separator	If needed a suitable tape separator between the conductor and insulation.
Insulation	EPDM rubber, halogen-free, lead-free compound, type 3GI3 acc. to DIN VDE 0207/20, developed by TF Kable
Color of insulation*	Colour coding of power conductors comply to HD 308, DIN VDE 0293- 308 Power cores: 4-core circuit identification: Green-yellow, brown, black, grey
Inner sheath	A synthetic thermosetting compound type Gm1b acc. to DIN VDE 0207/21, Black
Screen over inner sheath	Braid screen made of tinned copper wires - covering min. 80%
Outer sheath	Synthetic thermosetting compound, type 5GM3 acc. to DIN VDE 0207/21 developed by TF Kable , Black

* other core identification available on request

FEATURES

Rated Voltage U_0/U	0,6/1kV
Max. operating voltage Um	1,2 kV
AC test voltage	3 kV

- Current currying capacity: DIN VDE 0298-4

- Max. conductor operating temperature: +90°C
- Max. conductor temperature during short circuit: +250°C
- Minimum ambient temperature for fixed installation: -40°C
- Minimum ambient temperature for mobile installation: -25°C

- Minimum bending radius acc. to DIN VDE 0298-3:

OD of cable[mm]	>8 ≤ 12	>12≤ 20	>20
Fixed installation	3D	4D	4D
On drums	5D	5D	5D
On deflection pulleys	7,5D	7,5D	7,5D
Moving freely	4D	5D	5D

- Roller bending test
- Reeling test
- Travel speed up to: 240m/min
- Tensile load: 15N/mm^2

- Tear, impact and abrasion resistant outer sheath
- Flame propagation: PN-EN 60332-1-2, IEC 60332-1-2
- Oil resistant: PN-EN 60811-404, IEC 60811-404

UV resistant: UL 2556, ISO 4892-2
Ozone resistant: PN-ISO 1431-1

Example of standard sheath marking:
TF KABLE 3 CE FESTOONFLEX
(N)GRDGCGÖU-J 4x10 0,6/1kV year + meter

APPLICATIONS

Screened flexible cable designed for use on festoon systems, on hall gantry cranes, gantry cranes, rack material handling equipment, transportation system or machine tools. Suitable where the maximum emission values are required or where power cables are expected to cause interference and disruption on data cables. The cable is used under high mechanical stresses, especially for applications with frequent bending . Usable in wet or dry conditions, outdoors, indoors.

Standard length cable packing	500 m on drums. Other forms of packing and delivery are available on request

Number of cores x cross-section	Conductor diameter	Approx. overall diameter	Approx. weight	Max. tensile load
mm²	**mm**	**mm**	**kg/km**	**N**
4x2,5	2,1	15,8	382	150
4x4	2,7	18,2	539	240
4x6	3	19,0	629	360
4x10	4,1	23,3	977	600

POWER CONDUCTOR RESISTANCE

Cross- section	Max. conductor resistance at 20°C Plain wires
mm²	**Ω/km**
2,5	7,98
4	4,95
6	3,3
10	1,91

FESTOONFLEX (N)GRDGCGÖU -J
3+3PE symmetric construction

Based on: DIN VDE 0250-814

Low Voltage Screened Rubber Insulated Flexible Cable

DESIGN FEATURES

Conductors	Annealed flexible stranded bare copper conductor class 5 acc. to IEC 60228.
Separator	If needed a suitable tape separator between the conductor and insulation.
Insulation	EPDM rubber, halogen-free, lead-free compound, type 3GI3 acc. to DIN VDE 0207/20, developed by TF Kable
Color of insulation*	Colour coding of power conductors comply to HD 308, DIN VDE 0293- 308 Power cores: 3-core circuit identification: Brown, black, grey Earth cores: Green-yellow
Earth conductor	Tinned copper conductor rubber insulated
Core arrangement	Three power cores, earth conductor split into 3 parts and laid up around rubber filler in the centre.
Inner sheath	A synthetic thermosetting compound type Gm1b acc. to DIN VDE 0207/21, Black
Screen over inner sheath	Tinned copper wire braid - coverage min. 80%
Outer sheath	Synthetic thermosetting compound, type 5GM3 acc. to DIN VDE 0207/21 developed by TF Kable, Black

* other core identification available on request

FEATURES

Rated Voltage U_0/U	0,6/1kV
Max. operating voltage Um	1,2 kV
AC test voltage	3 kV

- Current currying capacity: DIN VDE 0298-4

- Max. conductor operating temperature: +90°C
- Max. conductor temperature during short circuit: +250°C
- Minimum ambient temperature for fixed installation: -40°C
- Minimum ambient temperature for mobile installation: -25°C

- Minimum bending radius acc. to DIN VDE 0298-3:

OD of cable[mm]	>8 ≤ 12	>12≤ 20	>20
Fixed installation	3D	4D	4D
On drums	5D	5D	5D
On deflection pulleys	7,5D	7,5D	7,5D
Moving freely	4D	5D	5D

- Roller bending test
- Reeling test
- Travel speed up to: 240m/min
- Tensile load: 15N/mm^2

- Tear, impact and abrasion resistant outer sheath
- Flame propagation: PN-EN 60332-1-2, IEC 60332-1-2
- Oil resistant: PN-EN 60811-404, IEC 60811-404

UV resistant: UL 2556, ISO 4892-2
Ozone resistant: PN-ISO 1431-1

Example of standard sheath marking:
TF KABLE 3 CE FESTOONFLEX (N)GRDGCGÖU-J
3x70+3x10 0,6/1kV year + meter

APPLICATIONS

Screened flexible cable designed for use on festoon systems, on hall gantry cranes, gantry cranes, rack material handling equipment, transportation system or machine tools. Suitable where the maximum emission values are required or where power cables are expected to cause interference and disruption on data cables. The cable is used under high mechanical stresses, especially for applications with frequent bending . Usable in wet or dry conditions, outdoors, indoors.

Standard length cable packing	500 m on drums. Other forms of packing and delivery are available on request

Number of cores x cross-section	Conductor diameter	Approx. overall diameter	Approx. weight	Max. tensile load
mm²	**mm**	**mm**	**kg/km**	**N**
3x16+3x2,5	5,1	23,9	1162	720
3x25+3x4	6,6	28,6	1700	1125
3x35+3x6	7,5	30,7	2137	1575
3x50+3x10	9,3	36,5	3035	2250
3x70+3x10	11,1	41,5	3953	3150
3x95+3x16	13	46,5	5106	4275
3x120+3x16	14,5	49,7	6104	5400
3x150+3x25	16,2	55,8	7806	6750

POWER CONDUCTOR RESISTANCE

Cross- section	Max. conductor resistance at 20°C	
	Plain wires	Tinned wires
mm²	**Ω/km**	**Ω/km**
2,5	7,98	8,21
4	4,95	5,09
6	3,3	3,39
10	1,91	1,95
16	1,21	1,24
25	0,78	0,795
35	0,554	0,565
50	0,386	0,393
70	0,272	0,277
95	0,206	0,21
120	0,161	0,164
150	0,129	0,132

FESTOONFLEX (N)GFLCGÖU -O

Based on: DIN VDE 0250-809

Low Voltage Flat Cable with individual screen

DESIGN FEATURES

Conductors	Special design ensuring higher flexibility. Annealed flexible stranded bare copper conductor: ▪ Up to 25 mm² - extra flexible, class 6 acc. to IEC 60228 ▪ Above 35 mm² - flexible, class 5 to IEC 60228.
Separator	If needed a suitable tape separator between the conductor and insulation.
Insulation	Special EPDM rubber, halogen-free, lead-free compound, type 3GI3 quality, developed by TF Kable
Circuit identification	Colour coding of power conductors comply to HD 308, DIN VDE 0293- 308 **-O version:** 3 - core: Brown, black, grey or blue, brown, black 4 - core: Blue, brown, black, grey 5 - core: Blue, brown, black, grey, black Above 5 cores: Black with white numbering
Individual screen	Tinned copper wire braid. For shielded cores - covering min. 60% For twisted and shielded pairs- covering min. 80%
Core arrangement	Parallel, for more than 12 cores: parallel bundles
Outer sheath	Special synthetic thermosetting compound, 5GM3 quality acc. to DIN VDE 0207/21 developed by TF Kable, Black

FEATURES

Rated Voltage U_0/U	300/500 V (600V)
Max. operating voltage Um	0,7/1,2 kV
AC test voltage	2,5 kV

▪ Current currying capacity: DIN VDE 0298-4

▪ Max. conductor operating temperature: +90°C
▪ Max. conductor temperature during short circuit: +250°C
▪ Minimum ambient temperature for fixed installation: -40°C
▪ Minimum ambient temperature for mobile installation: -25°C

- Minimum bending radius acc. to DIN VDE 0298-3:

Thickness of flat cable [mm]	>8 ≤ 12	>12≤ 20	>20
Fixed installation	3D	4D	4D
On drums	5D	5D	5D
On deflection pulleys	7,5D	7,5D	7,5D
Moving freely	4D	5D	5D

- Roller bending test
- Travel speed up to: 180m/min
- Tensile load: 15N/mm²

- Tear, impact and abrasion resistant outer sheath
- Flame propagation: PN-EN 60332-1-2, IEC 60332-1-2
- Oil resistant: PN-EN 60811-404, IEC 60811-404
- UV resistant: UL 2556, ISO 4892-2

Ozone resistant: PN-ISO 1431-1

Example of standard sheath marking:
TF KABLE 3 FESTOONFLEX (N)GFLCGÖU - O
4x(2x1mm2)c 300/500V year + meter

APPLICATIONS

Flexible flat cable designed for mechanical stresses, especially for applications with frequent bending during operation and for bending in one plane only. The cable is used on festoon systems and for connecting moveable parts of machine tools, material handling equipment. Used also on industrial lifting equipment.
Usable in wet or dry conditions, outdoors and indoors. Used also on industrial lifting equipment.

Standard length cable packing	500 m on drums. Other forms of packing and delivery are available on request

Number of cores x crss+section	Conductor diameter	Min height of flat cable	Max height of flat cable	Min width of flat cable	Max width of flat cable	Approx. weight	Max tensile load
mm²	**mm**	**mm**	**mm**	**mm**	**mm**	**kg/km**	**N**
12x1(C)	1,24	6,6	7,2	48,1	51,3	636	180
4x1,5(C)	1,5	6,8	7,4	18,4	19,5	253	90
8x1,5(C)	1,5	6,8	7,4	35	35,1	477	180
12x1,5(C)	1,5	7,4	8	51,8	55,7	773	270
4x(2x1)C	1,24	10,6	11,4	31,8	33,8	617	120
6x(2x2,5)C	1,89	14,8	15,7	61,5	65,1	1646	450
7x(2x1)C	1,24	10,5	11,5	53	56	1036	210
4x1,5(C)	1,5	6,8	7,4	18,4	19,5	253	90
4x4(C)	2,33	9,2	10,3	26,3	29,4	503	240

Number of cores x crss+section	Conductor diameter	Min height of flat cable	Max height of flat cable	Min width of flat cable	Max width of flat cable	Approx. weight	Max tensile load
mm²	**mm**	**mm**	**mm**	**mm**	**mm**	**kg/km**	**N**
4x6(C)	3,02	9,4	11,1	28,8	31,8	606	360
4x10(C)	4	11,6	13,3	36	39,1	936	600
4x16(C)	5	12,8	14,5	40,2	43,3	1239	960
4x25(C)	6,08	14,7	16,8	47,3	50,4	1779	1500
4x35(C)	7,3	16,9	19	53,4	57,5	2352	2100
4x50(C)	9	19,4	21,5	62	66,1	3185	3000
4x70(C)	10,8	21,8	23,9	69,8	73,9	4196	4200
4x95(C)	12,9	24,2	27,3	78,7	83,8	5364	5700

POWER CONDUCTOR RESISTANCE

Cross- section	Max. conductor resistance at 20°C Plain wires
mm²	**Ω/km**
1,5	13,3
2,5	7,98
4	4,95
6	3,3
10	1,91
16	1,21
25	0,78
35	0,554
50	0,386
70	0,272
95	0,206
120	0,161
150	0,129
185	0,106
240	0,0801
300	0,0641
400	0,0486

FESTOONFLEX NGFLGÖU -J/O

DIN VDE 0250-809

Low Voltage Flat Cable

DESIGN FEATURES

Conductors	Special design ensuring higher flexibility. Annealed flexible stranded bare copper conductor: ▪ Up to 25 mm² - extra flexible, class 6 acc. to IEC 60228 ▪ Above 35 mm² - flexible, class 5 to IEC 60228.
Separator	If needed a suitable tape separator between the conductor and insulation.
Insulation	Special EPDM rubber, halogen-free, lead-free compound, type 3GI3 quality, developed by TF Kable
Circuit identification	Colour coding of power conductors comply to HD 308, DIN VDE 0293- 308 **-J version:** 3 - core: Green-yellow, blue, brown 4 - core: Green-yellow, brown, black, grey or green-yellow, blue, brown, black 5 - core: Green-yellow, blue, brown, black, grey Above 5 cores: Green-yellow, other cores black with white numbering **-O version:** 3 - core: Brown, black, grey or blue, brown, black 4 - core: Blue, brown, black, grey 5 - core: Blue, brown, black, grey, black Above 5 cores: Black with white numbering
Core arrangement	Parallel, for more than 12 cores: parallel bundles
Outer sheath	Special, synthetic thermosetting compound, 5GM3 quality acc. to DIN VDE 0207/21 developed by TF Kable, Black

FEATURES

Rated Voltage U_0/U	300/500V (600V)
Max. operating voltage Um	0,7/1,2 kV
AC test voltage	2,5 kV

- Current currying capacity: DIN VDE 0298-4

- Max. conductor operating temperature: +90°C
- Max. conductor temperature during short circuit: +250°C
- Minimum ambient temperature for fixed installation: -40°C
- Minimum ambient temperature for mobile installation: -25°C

- Minimum bending radius acc. to DIN VDE 0298-3:

Thickness of flat cable [mm]	>8 ≤ 12	>12≤ 20	>20
Fixed installation	3D	4D	4D
On drums	5D	5D	5D
On deflection pulleys	7,5D	7,5D	7,5D
Moving freely	4D	5D	5D

- Roller bending test
- Travel speed up to: 180m/min
- Tensile load: 15N/mm²

- Tear, impact and abrasion resistant outer sheath
- Flame propagation: PN-EN 60332-1-2, IEC 60332-1-2
- Oil resistant: PN-EN 60811-404, IEC 60811-404
- UV resistant: UL 2556, ISO 4892-2

Ozone resistant: PN-ISO 1431-1

Example of standard sheath marking:
TF KABLE 3 CE FESTOONFLEX NGFLGÖU - J
4x25 300/500V year + meter

APPLICATIONS

Flexible flat cable designed for mechanical stresses, especially for applications with frequent bending during operation and for bending in one plane only. The cable is used on festoon systems and for connecting moveable parts of machine tools, material handling equipment.
Usable in wet or dry conditions, outdoors and indoors.

Standard length cable packing	500 m on drums. Other forms of packing and delivery are available on request

Number of cores x cross+section	Conductor diameter	Min height of flat cable	Max height of flat cable	Min width of flat cable	Max width of flat cable	Approx. weight	Max tensile load
mm²	**mm**	**mm**	**mm**	**mm**	**mm**	**kg/km**	**N**
3x1,5	1,5	5,5	6,0	11,8	12,5	126	68
4x1,5	1,5	5,7	6,2	15,2	15,8	167	90
5x1,5	1,5	5,5	6,0	18,4	20,1	201	113
7x1,5	1,5	5,5	6,0	24,9	26,8	273	158

Number of cores x cross+section	Conductor diameter	Min height of flat cable	Max height of flat cable	Min width of flat cable	Max width of flat cable	Approx. weight	Max tensile load
mm²	**mm**	**mm**	**mm**	**mm**	**mm**	**kg/km**	**N**
8x1,5	1,5	5,5	6,0	27,8	28,3	302	180
10x1,5	1,5	6,1	6,7	35,4	37,0	414	225
12x1,5	1,5	6,3	6,8	41,9	43,5	502	270
24x1,5	1,5	11,3	12,1	50,5	52,7	966	540
4x2,5	1,89	6,9	7,4	18,6	19,6	254	150
5x2,5	1,89	6,9	7,4	22,9	24,6	316	188
7x2,5	1,89	6,9	7,4	31	32,8	429	263
8x2,5	1,89	6,9	7,4	34,1	35,9	475	300
10x2,5	1,89	7,3	7,9	43	45,3	623	375
12x2,5	1,89	7,1	8,0	50,6	53,5	738	450
24x2,5	1,89	15	15,8	68,6	69,2	1708	900
4x4	2,33	8,5	9,0	23	24,0	387	240
4x6	3,02	9,1	9,6	25,5	27,0	494	360
4x10	4	10,4	11,3	31,3	32,8	738	600
4x16	5	12,2	13,0	36,1	37,6	1056	960
4x25	6,08	13,7	14,5	42,3	43,8	1488	1500
4x35	7,3	15,8	16,8	48,8	50,3	2024	2100
4x50	9	18,3	19,3	56,9	59,0	2796	3000
4x70	10,8	20,5	21,5	63,9	66,0	3710	4200
4x95	12,9	23,4	24,5	74,1	76,2	4838	5700
4x120	13,97	24,2	27,2	79,1	83,2	5986	7200
5x4	2,33	8,5	9,0	28,9	31,2	492	300
5x6	3,02	9,1	9,6	31,8	39,1	652	450
5x10	4	10,4	11,3	39,2	41,6	928	750
5x16	5	12,1	12,7	45,1	47,6	1313	1200
7x4	2,33	8,5	9,0	38,5	40,9	661	420
7x6	3,02	9,1	9,6	42,8	45,3	839	630
7x10	4	10,4	11,3	52,9	55,9	1267	1050
7x16	5	12,6	13,4	60,7	63,9	1845	1680
7x25	6,08	14,9	15,7	73,3	76,6	2719	2625
7x35	7,3	16,4	17,4	83,6	87,0	3581	3675

POWER CONDUCTOR RESISTANCE

Cross- section	Max. conductor resistance at 20°C Plain wires
mm²	**Ω/km**
1,5	13,3
2,5	7,98
4	4,95
6	3,3
10	1,91
16	1,21
25	0,78
35	0,554
50	0,386
70	0,272
95	0,206
120	0,161
150	0,129
185	0,106
240	0,0801
300	0,0641
400	0,0486

FESTOONFLEX M(StD)HÖU -J/O

Based on: DIN VDE 0250-809

Low Voltage Flat Cable with individual screen

DESIGN FEATURES

Conductors	Special design ensuring higher flexibility. Annealed flexible stranded bare copper conductor: ▪ Up to 25 mm² - extra flexible, class 6 acc. to IEC 60228 ▪ Above 35 mm² - flexible, class 5 to IEC 60228.
Separator	If needed a suitable tape separator between the conductor and insulation.
Insulation	Special EPDM rubber, halogen-free, lead-free compound, type 3GI3 quality, developed by TF Kable
Circuit identification	Colour coding of power conductors comply to HD 308, DIN VDE 0293- 308 **-J version:** 3 - core: Green-yellow, blue, brown 4 - core: Green-yellow, brown, black, grey or green-yellow, blue, brown, black 5 - core: Green-yellow, blue, brown black, grey Above 5 cores: Green-yellow, other cores black with white numbering **-O version:** 3 - core: Brown, black, grey or blue, brown, black 4 - core: Blue, brown, black, grey 5 - core: Blue, brown, black, grey, black Above 5 cores: Black with white numbering
Individual screen	Aluminium/polyester tape under the metallic screen. Spinning of tinned copper wires with a few polyamide yarns in opposite direction. Wrapping with polyester tape. For shielded cores and twisted and shielded pairs - covering min. 85%
Core arrangement	Parallel, for more than 12 cores: parallel bundles
Outer sheath	Special synthetic thermosetting compound, 5GM3 quality acc. to DIN VDE 0207/21 developed by TF Kable, Black

FEATURES

Rated Voltage U_0/U	0,6/1kV
Max. operating voltage Um	1,2 kV
AC test voltage	2,5 kV

- Current currying capacity: DIN VDE 0298-4

- Max. conductor operating temperature: +90°C
- Max. conductor temperature during short circuit: +250°C
- Minimum ambient temperature for fixed installation: -40°C
- Minimum ambient temperature for mobile installation: -25°C

- Minimum bending radius acc. to DIN VDE 0298-3:

Thickness of flat cable [mm]	>8 ≤ 12	>12≤ 20	>20
Fixed installation	3D	4D	4D
On drums	5D	5D	5D
On deflection pulleys	7,5D	7,5D	7,5D
Moving freely	4D	5D	5D

- Roller bending test
- Travel speed up to: 180m/min
- Tensile load: 15N/mm²

- Tear, impact and abrasion resistant outer sheath
- Flame propagation: PN-EN 60332-1-2, IEC 60332-1-2
- Oil resistant: PN-EN 60811-404, IEC 60811-404
- UV resistant: UL 2556, ISO 4892-2

Ozone resistant: PN-ISO 1431-1

Example of standard sheath marking:
TF KABLE 3 CE FESTOONFLEX M(StD)HÖU-J 4x16
0,6/1kV year + meter

APPLICATIONS

Flexible, screened flat cable designed for festoon application, for medium mechanical stresses, in particular for hoisting gear transportation systems, machine tools, for bending in one plane only.
Usable in wet or dry conditions, outdoors and indoors.

Standard length cable packing	500 m on drums. Other forms of packing and delivery are available on request

Number of cores x cross+section	Conductor diameter	Min height of flat cable	Max height of flat cable	Min width of flat cable	Max width of flat cable	Approx. weight	Max tensile load
mm²	**mm**	**mm**	**mm**	**mm**	**mm**	**kg/km**	**N**
4x1,5	1,5	7	8,1	20	21,5	289	90
4x2,5	1,89	7,6	8,8	22,7	24,2	366	150
4x4	2,33	8,4	9,5	25,6	27,7	474	240
4x6	3,02	8,8	10,5	28	30,1	586	360
4x10	4	11,1	12,1	34,7	36,7	891	600
4x16	5	12,3	13,8	38,9	41,5	1237	960
4x25	6,08	12,4	15,5	43	47,1	1629	1500
4x35	7,3	14,6	17	49,8	53,2	2225	2100
4x50	9	17,1	19,8	58	61,6	3048	3000
4x70	10,8	22	24,1	73	77	4494	4200
4x95	12,9	22,7	25,3	76,3	81,9	5391	5700
5x1,5	1,5	7	8,1	23,8	25,9	349	110
8x1,5	1,5	7	8,1	36,2	38,7	533	180
12x1,5	1,5	7	8,1	52,6	57,1	786	270
4x4x1,5	1,5	10	13,1	36,6	42,6	798	360
6x2,5	1,89	7,6	8,8	31,4	33,5	519	220
12x2,5	1,89	7,6	8,8	59,9	64	1002	450
4x(2x1)	1,24	10,1	11,8	30	33,6	551	120
7x(2x1)	1,24	10,9	12,6	55,3	59,1	1053	210
12x(2x1)	1,24	13,7	17,1	65,5	88,2	2030	360

POWER CONDUCTOR RESISTANCE

Cross- section	Max. conductor resistance at 20°C Plain wires
mm²	**Ω/km**
1,5	13,3
2,5	7,98
4	4,95
6	3,3
10	1,91
16	1,21
25	0,78
35	0,554
50	0,386
70	0,272
95	0,206
120	0,161
150	0,129
185	0,106
240	0,0801
300	0,0641
400	0,0486

Notes

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