


U.I. Lapp GmbH	PRODUCT INFORMATION	
	ÖLFLEX® TORSION FRNC	12.09.2012

Cold and oil-resistant cables for flexible applications under torsional load, halogen-free - 0.6/1 kV

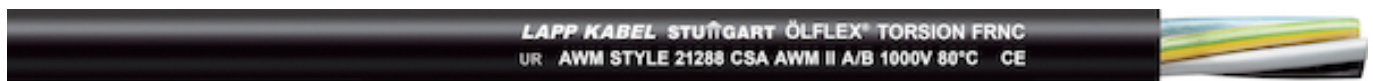
The special design reliably compensates for the permanent torsional movements inside the wind turbine between the nacelle and the tower

The high flexibility and good dismantling and stripping properties enable easy space- saving cable installation and fast processing

Sea water-resistant for onshore and offshore applications

FRNC = Flame Retardant Non Corrosive - Reduction of flame-propagation and density and toxicity of smoke gases in the event of fire - Minimisation of damage to buildings and production facilities - Safety for staff and in areas with high density of people

The copper wrapping of the screened D version protects against electromagnetic interference



Info

Torsion-resistant and very flexible

Improved characteristics in the event of a fire

Certified for the USA and Canada

Application range

For fixed and flexible installations, as well as for applications with torsional movements (e.g. machinery, wind turbines)

Very suitable for installation in the drip-loop, between the rotating nacelle and the stationary windmill tower, to connect the generator to the control units

Design

Extra-fine wire conductor made of bare copper

Core insulation: polyolefin compound, LSZH

Core connection optimised for high torsion requirements, twisted in layers

Optional screening (D): wrapped with braided tinned-copper wires

Outer sheath: special compound, halogen-free, black (RAL 9005)

Approvals (Norm references)

UL AWM Style 21288 / cUL AWM II A/B


Fire behaviour: - Halogen-free (IEC 60754-1) - No corrosive gases (IEC 60754-2) - Low smoke density (IEC 61034-2) - Flame-retardant (IEC 60332-1-2) - No fire propagation (IEC 60332-3-24 and IEC 60332-3-25)

Oil-resistant according to EN 60811-2-1 and UL OIL RES I and UL OIL RES II

UV-resistant according to ISO 4892-2 and ozone-resistant according to EN 50396

Use of leading, European metric stranded conductors according to the IEC scale for conductor nominal cross-sections in mm² according to IEC 60228/VDE 0295, braided conductor class 6 (tinned): For converting to AWG, odd-numbered nominal AWG cross-sections must be excluded. The next lowest nominal AWG conductor cross-section in mm² must then be allocated to the metric nominal conductor cross-section in mm² (according to IEC 60228) (please refer to the technical catalogue appendix T16). This is to ensure that the normative current rating defined by the nominal AWG conductor cross-section does not exceed the physical/real current rating defined by the nominal IEC conductor cross-section that is actually used

Product Management	Document: LAPP_PRO140870EN.pdf	1 / 4
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Product features

Torsion-resistant up to $\pm 150^\circ/\text{m}$
 Good weather, abrasion, temperature and UV-resistance
 Resistant to oils
 Halogen-free and highly flame-retardant
 Depending on the quantity, customised designs are also possible upon request

Remark

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
 Copper price basis: EUR 150/100kg. Refer to Appendix T17 for the definition and calculation of copper-related surcharges.
 Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
 Packaging size: Drum
 Details of the clamping force are available upon request, halogen-free.
 Photographs are not to scale and do not represent detailed images of the respective products.

Technical Data

Core identification code:	Power and control cables: Colour-coded in accordance with VDE 0293-308, refer to Appendix T9 From 6 cores: black with white numbers Paired signal cables: DIN 47100
Approvals:	UL AWM Style 21288 cUL AWM II A/B
Specific insulation resistance:	> 20 GOhm x cm
Conductor stranding:	Extra-fine wire acc. to VDE 0295, class 6/ IEC 60228 class 6 (Refer to Appendix T16 for the matching US conductor sizes in AWG standard)
Torsion movement in WTG:	TW-0 & TW-2 refer to catalogue, Appendix T0
Minimum bending radius:	Flexible use: 10 x outer diameter Fixed installation: 6 x outer diameter
Nominal voltage:	According to IEC/VDE: U_0/U 0.6/1 kV ac Operating voltage in accordance with UL: 1000V
Test voltage:	C/C: 4000 V
Protective conductor:	G = with GN-YE protective conductor X = without protective conductor
Temperature range:	Flexible use: -40°C to $+90^\circ\text{C}$ (UL $+80^\circ\text{C}$) Fixed installation: -40°C to $+90^\circ\text{C}$ (UL $+80^\circ\text{C}$)

Product Management	Document: LAPP_PRO140870EN.pdf	2 / 4
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Part number	Number of cores and mm ² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® TORSION FRNC				
1150199	12 G 0,75	12,4	86.4	237
1150377	14 G 0,75	13,0	100.8	291
1150201	18 G 0,75	14,6	129.6	323
1150204	25 G 0,75	17,8	180.0	480
1150208	50 G 0,75	24,2	360.0	886
1150373	12 G 1,0	13,2	115.2	274
1150378	16 G 1,0	14,8	153.6	392
1150271	3 G 1,5	9,0	43.2	131
1150272	4 G 1,5	9,7	57.6	156
1150273	5 G 1,5	10,6	72.0	183
1150275	7 G 1,5	12,6	100.8	253
1150279	12 G 1,5	15,3	172.8	386
1150280	18 G 1,5	18,3	259.2	563
1150374	25 G 1,5	22,8	360.0	837
1150375	32 G 1,5	24,5	460.8	994
1150311	3 G 2,5	10,4	72.0	181
1150312	4 G 2,5	11,3	96.0	242
1150313	5 G 2,5	12,4	120.0	258
1150315	7 G 2,5	15,0	168.0	372
1150319	12 G 2,5	18,9	288.0	567
1150322	19 G 2,5	23,9	456.0	925
1150376	25 G 2,5	26,8	600.0	1183
1150350	3 G 4	11,9	115.2	254
1150351	4 G 4	13,0	153.6	313
1150352	5 G 4	14,3	192.0	370
1150355	3 G 6	12,9	172.8	338
1150356	4 G 6	14,4	230.4	401
1150357	5 G 6	16,0	288.0	486

Part number	Number of cores and mm ² per conductor	Outer diameter (mm)	Copper index (kg/km)	Weight (kg/km)
1150360	3 G 10	16,6	288.0	556.1
1150361	4 G 10	18,4	384.0	658
1150362	5 G 10	20,5	480.0	799
1150366	4 G 16	22,2	614.4	1061
1150367	5 G 16	24,4	768.0	1188
1150371	4 G 25	26,9	960.0	1526
1150372	5 G 25	29,9	1200.0	1881
1150369	5 G 35	33,7	1680.0	2520
1150379	5 G 50	39,5	2400.0	3710