

HELUWIND® WK 135-TORSION-MULTI

extremely abrasion-resistant



HELUWIND® WK 135-TORSION-MULTI CE

TECHNICAL DATA

Torsion resistant cable acc. to UL-Std. 758 (AWM) Style 20234, CSA-Std. C22.2 No. 210 - AWM I/II A/B

Temperature range flexible -40°C to +90°C
fixed -40°C to +90°C
UL (AWM) flexible to +80°C

Permissible operating temperature of the conductor +90°C

Nominal voltage VDE AC U₀/U 600/1000 V
UL (AWM) AC 1000 V

Max. permissible operating voltage
alternating current (AC) conductor/earth 700 V
three-phase alternating current (AC) conductor/conductor 1200 V
direct current (DC) conductor/earth 900 V
direct current (DC) conductor/conductor 1800 V

Test voltage core/core 4000 V

Minimum bending radius flexible 8x Outer-Ø
fixed 4x Outer-Ø

- Torsion tested
- halogen-free
- recyclable
- highly flame-retardant
- Suitable for use in multiple climates
- Designed for CCV applications
- Suitable for offshore applications
- Torsion angle: +/- 150°/m

TESTS

- halogen-free acc. to DIN VDE 0482-754-1 / DIN EN 60754-1 / IEC 60754-1
- flame-retardant acc. to CSA FT1
- bundle fire test acc. to DIN VDE 0482-332-3-24 / DIN EN 60332-3-24 / IEC 60332-3-24
- smoke density acc. to DIN VDE 0482-1034-1+2 / DIN EN 61034-1+2 / IEC 61034-1+2
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404, UL Std 1277 Tab. 12.2, Oil Res I / Oil Res II
- Cable Flame Test acc. to UL Std. 1581 Sec. 1061

APPLICATION

Designed for flexible use, especially for torsional stress in the cable loop of a wind turbine. Thanks to its halogen-free design and extremely abrasion-resistant sheath, it is ideal for use in offshore wind turbines. The voltage level for all dimensions is designed for 0.6/1 kV. This means that the cable can also be laid in parallel in accordance with UL standards; spatial separation of the cable routes is not necessary. The HELU WK series has been successfully tested with over 18,000 torsion cycles and therefore offers optimum functional reliability far beyond the service life of a wind turbine. Advantages of the WK 135 torsion compared to H07BN4-F: Fire behaviour according to IEC 60332-3-24, higher abrasion resistance.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- Further details, as well as information regarding custom solutions and suitable connection technology, can be found at wind@heluka-bel.de

CABLE STRUCTURE

- Copper wire bare acc. to DIN VDE 0295 / IEC 60228
- Core insulation: special compound
- Core identification: see table
- Protective conductor: starting with 3 cores, G = with protective conductor GN-YE, in the outer layer, x = without protective conductor
- Cores stranded in layers with optimal lay lengths
- Outer sheath: special compound
- Sheath colour: black

PROPERTIES

- resistant to: oil, UV radiation
- extremely abrasion-resistant, low adhesion

Core identification acc. to DIN VDE 0293-334, black cores with consecutive labeling in white digits

Part no.	No. cores x cross-sec. mm ²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
703668	4 G 0.34	22	7.1	29.0	88.0
703669	4 G 0.5	20	7.4	34.0	98.0
703671	6 G 0.5	20	8.6	49.0	122.0
703289	10 G 0.5	20	10.8	48.0	165.0
703673	12 G 0.5	20	11.1	84.0	208.0
703291	3 G 0.75	19	7.3	22.0	77.0
703292	4 G 0.75	19	7.9	29.0	100.0
703293	5 G 0.75	19	8.6	36.0	120.0
703294	7 G 0.75	19	10.0	51.0	170.0

Part no.	No. cores x cross-sec. mm ²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
704699	10 G 0.75	19	11.0	72.0	200.0
703295	12 G 0.75	19	11.8	87.0	220.0
704700	14 G 0.75	19	12.5	101.0	238.0
704701	16 G 0.75	19	13.2	116.0	271.0
704702	18 G 0.75	19	13.9	130.0	310.0
704703	21 G 0.75	19	15.2	152.0	380.0
703296	25 G 0.75	19	16.9	180.0	490.0
704704	32 G 0.75	19	18.2	231.0	560.0
704705	36 G 0.75	19	19.1	260.0	620.0

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Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.	Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
704706	40 G 0.75	19	20.5	288.0	729.0	704732	41 G 1.5	16	25.0	591.0	1050.0
709628	2 x 1	18	7.0	19.2	71.6	704733	50 G 1.5	16	27.7	720.0	1200.0
704707	4 G 1	18	8.3	39.0	100.0	703303	3 G 2.5	14	9.3	72.0	152.0
704708	5 G 1	18	9.0	48.0	110.0	703304	4 G 2.5	14	10.1	96.0	191.7
704709	7 G 1	18	10.1	68.0	167.5	703305	5 G 2.5	14	11.1	120.0	231.7
704710	10 G 1	18	13.0	96.0	220.0	703306	7 G 2.5	14	13.2	168.0	317.7
704711	12 G 1	18	12.9	116.0	240.0	704734	10 G 2.5	14	15.8	240.0	480.0
704712	14 G 1	18	13.4	135.0	280.0	703307	12 G 2.5	14	16.3	288.0	497.3
704713	16 G 1	18	14.1	154.0	310.0	705046	19 G 2.5	14	21.0	456.0	835.0
704714	18 G 1	18	15.1	173.0	360.0	704735	3 G 4	12	10.6	116.0	215.6
704715	21 G 1	18	16.7	202.0	410.0	704736	4 G 4	12	13.6	153.6	315.8
704716	25 G 1	18	18.4	240.0	500.0	703308	5 G 4	12	13.2	192.0	333.4
704717	32 G 1	18	19.8	308.0	590.0	703309	7 G 4	12	15.9	269.0	471.8
704718	36 G 1	18	20.6	346.0	700.0	703310	12 G 4	12	19.6	461.0	740.0
704719	40 G 1	18	22.4	384.0	800.0	704737	3 G 6	10	12.5	173.0	327.9
704720	41 G 1	18	22.4	394.0	810.0	704738	4 G 6	10	13.6	231.0	414.8
704721	50 G 1	18	24.6	480.0	980.0	704471	5 G 6	10	16.3	288.0	540.5
704722	2 x 1.5	16	7.9	29.0	75.0	704739	7 G 6	10	19.6	404.0	780.0
703298	3 G 1.5	16	8.4	44.0	113.0	710868	3 G 10	8	16.7	288.0	535.2
703299	4 G 1.5	16	9.0	58.0	138.2	703311	4 G 10	8	18.6	384.0	686.0
709081	4 x 1.5	16	9.0	58.0	134.9	703312	5 G 10	8	20.9	480.0	884.4
703300	5 G 1.5	16	9.9	72.0	165.0	704740	7 G 10	8	23.5	672.0	1150.0
703301	7 G 1.5	16	11.6	100.8	227.8	703313	4 G 16	6	23.2	614.4	1225.0
704723	10 G 1.5	16	13.1	144.0	270.0	703314	5 G 16	6	25.4	768.0	1436.0
703302	12 G 1.5	16	14.0	172.8	343.3	703315	4 G 25	4	25.9	960.0	1531.0
704724	14 G 1.5	16	14.9	202.0	420.0	703316	5 G 25	4	29.7	1200.0	1864.0
704725	16 G 1.5	16	15.7	231.0	450.0	704742	4 G 35	2	30.6	1344.0	2115.0
704726	18 G 1.5	16	16.8	260.0	510.0	704743	5 G 35	2	34.5	1680.0	2752.0
704727	21 G 1.5	16	17.8	303.0	590.0	708681	3 G 50	1	34.7	1440.0	2356.0
704728	25 G 1.5	16	20.6	360.0	760.9	704744	4 G 50	1	32.8	1920.0	2746.0
704729	32 G 1.5	16	22.2	460.0	900.0	707651	3 G 70	2/0	36.8	2016.0	3374.4
704730	36 G 1.5	16	23.1	519.0	980.0	707130	5 G 70	2/0	45.7	3360.0	5420.0
704731	40 G 1.5	16	25.0	576.0	1030.0	705108	4 G 95	3/0	45.4	3648.0	5284.0

Core identification acc. to DIN VDE 0293-308, colour coded

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.	Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
17001319	3 G 2.5	14	9.9	72.0	160.0	17009365	5 G 25	4	29.7	1200.0	1864.0
707454	4 G 2.5	14	10.1	96.0	184.9	707455	4 G 35	2	30.6	1344.0	2118.0
17001320	3 G 4	12	12.4	116.0	220.0	707464	5 G 35	2	34.5	1680.0	2692.0
707456	5 G 6	10	16.5	288.0	555.1	714307	5 G 50	1	40.0	2400.0	4350.0
17009363	5 G 10	8	20.9	480.0	884.4	707457	5 G 70	2/0	45.7	3360.0	5420.0
17009364	5 G 16	6	25.4	768.0	1436.0	708436	4 G 95	3/0	45.4	3648.0	5294.0
707463	4 G 25	4	26.2	960.0	1530.0	708687	5 G 95	3/0	51.0	4560.0	6765.0