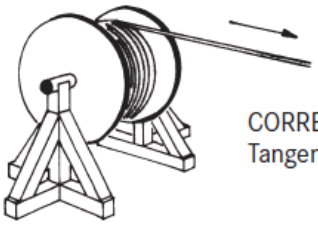
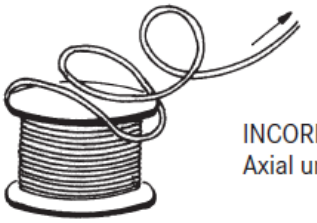
ÖLFLEX® SOLAR cable installation guidelines

1) Unreeling



CORRECT:
Tangential unreeling



INCORRECT:
Axial unreeling

- The cable must be unreeled from the ring or drum free of any twists and must be laid out straight. This work should be carried out before starting the installation works.
- PLEASE NOTE: Due to the manufacturing process, the marking on the cables runs in a gentle spiral round the cables. As such, it cannot be used as an indicator of whether the cable is free of twists.
- When unreeling cables from cable drums, make sure the cable does not grind against any objects. Likewise, the cable should not be pulled over sharp corners and edges.

2) Laying and installing

Bending radii

The values for the minimum permissible bending radii of the cables must not fall below the prescribed values as stated in the product data sheet. Below values apply to most ÖLFLEX® SOLAR cables:

Occasional flexing -> 15 x cable diameter
Fixed installation -> 4 x cable diameter

Tensile strain

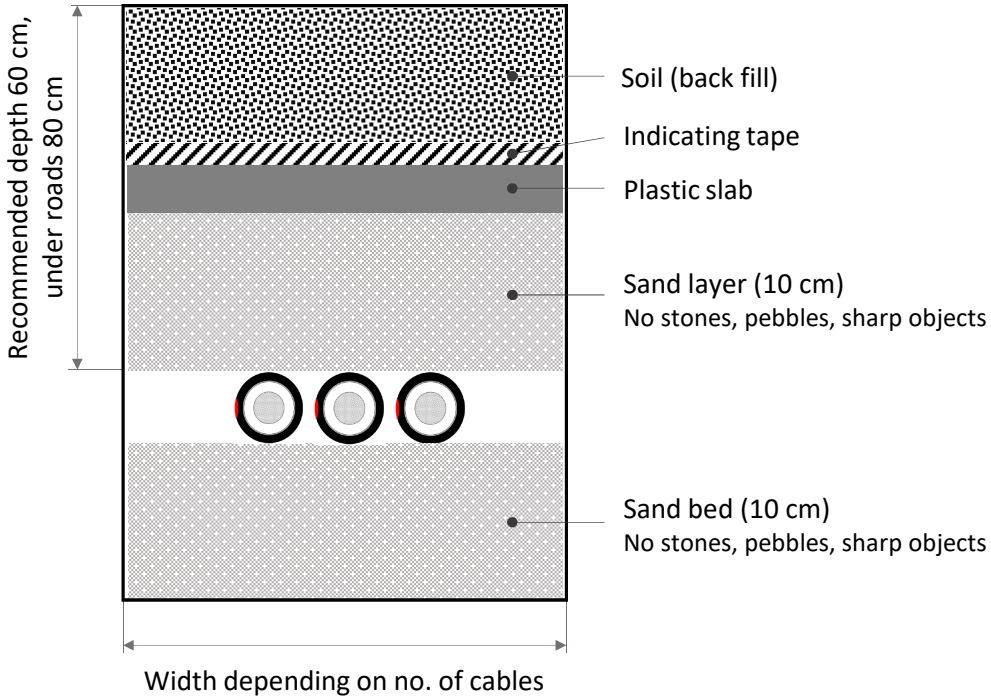
Tensile strain on the conductor should be as low as possible. The following tensile strains for conductors must not be exceeded:

- Laying cables for portable equipment: **15 N per mm2** conductor cross-section; this does not include screening, concentric conductors and divided protective conductors.
- Laying cables for fixed installation: **50 N per mm2** conductor cross-section.

Nominal voltage

The nominal voltage is the reference voltage for which cables and wires are constructed and tested. The nominal voltage of cables and wires used with AC supplies must be greater than or equal to the nominal supply voltage. In the case of a DC supply, the nominal supply voltage must not exceed the nominal voltage of the cable by a factor greater than 1.5. The continuous operating voltage of AC and DC supplies must not exceed the nominal supply voltage by more than 10 %.

3) Cable trench structure according to VDE 0100 part 520



Application

ÖLFLEX® SOLAR cables are weather-, abrasion- and UV-resistant photovoltaic cables. These crosslinked, halogen free and double insulated solar cables are suitable for permanent outdoor use and especially for the interconnection of grounded and ungrounded photovoltaic power systems. They are applicable for the connection of solar panels among themselves and as extension cable between the individual module strings or the DC/AC inverter. The expected period of use under normal usage conditions as specified in EN 50618 is at least 25 years.

ÖLFLEX® SOLAR XLS-R, XLR-R, XLR-E and H1Z2Z2-K cables can only be routed underground in protective tubing suitable for burial. It has to be ensured that no long-term contact with water will occur and that any waterlogging is sure to be drawn away. The underground installation and the correct carrying out of the burial must comply with VDE 0100 part 520 or comparable standards, in order to prevent damage to the protective tubing and the constant exposure of the cables to penetrating water. Long-term, permanent storage or constant use of these cables in or underwater is not permitted!

ÖLFLEX® SOLAR XLR WP and XLWP cables are suitable for direct burial considering the common VDE installation guide lines. Due to an optimized cable design, a constant high volume resistivity can be ensured even after long-term period in not contaminated water. Storage or use in standing waters or running waters is not permitted acc. to relevant standards. For direct burial installation, installation in conduits or for open wiring even in water, where the cables can be / are exposed to not contaminated water (salt or fresh water), the use is only permitted with the following conditions:

Water temperature: +45°C (maximum)
Water pressure: 0.08 bar; 8kPa (maximum)

Additional tractive forces or shear conditions during installation and operation have to be ruled out.

4) Current carrying capacities

Current carrying capacity of ÖLFLEX® SOLAR cables
Strombelastbarkeit von ÖLFLEX® SOLAR Leitungen

Current rating at 30°C ambient temperature Strombelastbarkeit bei 30 °C Umgebungs-temperatur	**Single cable free in air** Einzelne Leitung frei in Luft 	**Single cable on surfaces** Einzelne Leitung an Flächen 	**2 cables adjacent on surfaces** 2 sich berührende Leitungen an Flächen 
ÖLFLEX® SOLAR XLR-E			
1 x 1.5 mm²	30 A	29 A	24 A
1 x 2.5 mm²	41 A	39 A	33 A
1 x 4 mm²	55 A	52 A	44 A
1 x 6 mm²	70 A	67 A	57 A
1 x 10 mm²	98 A	93 A	79 A
1 x 16 mm²	132 A	125 A	107 A
1 x 25 mm²	176 A	167 A	142 A
1 x 35 mm²	218 A	207 A	176 A
1 x 50 mm²	276 A	262 A	221 A
1 x 70 mm²	347 A	330 A	278 A
1 x 95 mm²	416 A	395 A	333 A
1 x 120 mm²	488 A	464 A	390 A
1 x 150 mm²	566 A	538 A	453 A
1 x 185 mm²	644 A	612 A	515 A
1 x 240 mm²	775 A	736 A	620 A
1 x 300 mm²	898 A	853 A	718 A
ÖLFLEX® SOLAR XLWP			
1 x 1.5 mm²	30 A	29 A	24 A
1 x 2.5 mm²	41 A	39 A	33 A
1 x 4 mm²	55 A	52 A	44 A
1 x 6 mm²	70 A	67 A	57 A
1 x 10 mm²	98 A	93 A	79 A
1 x 16 mm²	132 A	125 A	107 A
ÖLFLEX® SOLAR XLS-R			
1 x 1.5 mm²	30 A	29 A	24 A
1 x 2.5 mm²	41 A	39 A	33 A
1 x 4 mm²	55 A	52 A	44 A
1 x 6 mm²	70 A	67 A	57 A
1 x 10 mm²	98 A	93 A	79 A
1 x 16 mm²	132 A	125 A	107 A

Conversion factors for deviating temperatures Umrechnungsfaktoren für abweichende Temperaturen		
Ambient temperature Umgebungstemperatur	**XLR-E / XLWP**	**XLS-R / XLSv**
40 °C	1.00	0.91
50 °C	1.00	0.82
60 °C	1.00	0.71
70 °C	0.91	0.58
80 °C	0.82	0.41
90 °C	0.71	0.33
100 °C	0.58	-
110 °C	0.41	-

Reduction factors for bundling according to IEC 60364-5-52, table B 52.17
Reduktionsfaktoren bei Häufung nach IEC 60364-5-52, Tabelle B 52.17

5) Voltage drop

ÖLFLEX® SOLAR Cables - Voltage drop (mV/Am) - Single conductor

ÖLFLEX® SOLAR Leitungen - Spannungsabfall (mV/Am) - Einzelner Leiter

Voltage drop (single conductor) Spannungsabfall (einzelner Leiter)	**Conductor temperature** - Leitertemperatur									
	30°C	**40°C**	**50°C**	**60°C**	**70°C**	**80°C**	**90°C**	**100°C**	**110°C**	**120°C**
ÖLFLEX® SOLAR XLR-E (EN 50618)	**mV/Am**									
1.5 mm²	14.23	14.77	15.30	15.84	16.37	16.91	17.44	17.97	18.51	19.04
2.5 mm²	8.53	8.85	9.17	9.49	9.81	10.13	10.45	10.77	11.09	11.41
4 mm²	5.29	5.49	5.69	5.88	6.08	6.28	6.48	6.68	6.88	7.08
6 mm²	3.52	3.65	3.79	3.92	4.05	4.18	4.32	4.45	4.58	4.71
10 mm²	2.03	2.10	2.18	2.25	2.33	2.41	2.48	2.56	2.63	2.71
16 mm²	1.29	1.34	1.39	1.43	1.48	1.53	1.58	1.63	1.68	1.72
25 mm²	0.826	0.857	0.888	0.919	0.950	0.981	1.012	1.043	1.074	1.105
35 mm²	0.587	0.609	0.631	0.653	0.675	0.697	0.719	0.741	0.763	0.785
50 mm²	0.408	0.424	0.439	0.454	0.470	0.485	0.500	0.516	0.531	0.546
70 mm²	0.288	0.299	0.309	0.320	0.331	0.342	0.353	0.363	0.374	0.385
95 mm²	0.218	0.226	0.235	0.243	0.251	0.259	0.267	0.276	0.284	0.292
120 mm²	0.170	0.177	0.183	0.190	0.196	0.202	0.209	0.215	0.222	0.228
150 mm²	0.137	0.142	0.147	0.153	0.158	0.163	0.168	0.173	0.178	0.183
185 mm²	0.112	0.116	0.121	0.125	0.129	0.133	0.137	0.142	0.146	0.150
240 mm²	0.085	0.088	0.091	0.095	0.098	0.101	0.104	0.107	0.111	0.114
300 mm²	0.068	0.071	0.073	0.076	0.078	0.081	0.083	0.086	0.089	0.091
ÖLFLEX® SOLAR XLWP (EN 50618)	**mV/Am**									
1.5 mm²	14.23	14.77	15.30	15.84	16.37	16.91	17.44	17.97	18.51	19.04
2.5 mm²	8.53	8.85	9.17	9.49	9.81	10.13	10.45	10.77	11.09	11.41
4 mm²	5.29	5.49	5.69	5.88	6.08	6.28	6.48	6.68	6.88	7.08
6 mm²	3.52	3.65	3.79	3.92	4.05	4.18	4.32	4.45	4.58	4.71
10 mm²	2.03	2.10	2.18	2.25	2.33	2.41	2.48	2.56	2.63	2.71
16 mm²	1.29	1.34	1.39	1.43	1.48	1.53	1.58	1.63	1.68	1.72
ÖLFLEX® SOLAR XLS-R	**mV/Am**									
1.5 mm²	14.23	14.77	15.30	15.84	16.37	16.91	17.44	17.97	-	-
2.5 mm²	8.53	8.85	9.17	9.49	9.81	10.13	10.45	10.77	-	-
4 mm²	5.29	5.49	5.69	5.88	6.08	6.28	6.48	6.68	-	-
6 mm²	3.52	3.65	3.79	3.92	4.05	4.18	4.32	4.45	-	-
10 mm²	2.03	2.10	2.18	2.25	2.33	2.41	2.48	2.56	-	-
16 mm²	1.29	1.34	1.39	1.43	1.48	1.53	1.58	1.63	-	-