TowerFlex® is available in a streamlined version, that is as pliable and easy to install as the copper version.

TowerFlex®-S Global

Is Draka's most recent cable innovation. It's a low voltage cable concept applicable for fixed installation in nearly all sections of the wind turbine. Besides a standard version it's optionally available in halogen free, EMC-screened and extra flame retardant version.

Range and Rated Voltage

TowerFlex®-S Global is available with copper or aluminium conductor, screened or unscreened, for rated voltage of 0.6/1 (1.2) kV and optionally 1.8/3 (3.6) kV. TowerFlex single core cables are available from 1.5mm² up to 630mm². Multi-core cables are available from 1.5mm² up to 300mm².

Pliability

The TowerFlex®-AS Global with aluminium conductor is extraordinary pliable and has excellent bending behaviour. This makes it as easy to install as the copper version.

Streamlined Version

TowerFlex®-S Global cables are designed with a thinner insulation and sheath thickness specified in IEC 60502-1. Due to their reduced weight they are easy to transport, store and install. The application of advanced compound materials means, that they adhere to the same stringent demands as our existing range of low voltage cables, without compromising safety.

Conductor Materials

TowerFlex®-S Global is a comprehensive cable program. You can choose between a standard conductor design employing copper or an aluminium version. With lower weight the latter design allows for easier installation.

Design Strengths

The TowerFlex®-S Global design is based on existing and proven WindFlex® technology, which offers an effective combination of both rubber insulation and sheathing. TowerFlex cables are robust due to a special high quality thermoset insulating and jacketing compound, a -40°C to +90°C temperature range, plus a special 120°C version.

Oil and Chemical Resistance

TowerFlex®-S offers excellent resistance against mineral and synthetic gear oils, cooling fluids as well as hydraulic oils. We are committed to upholding this standard, by constantly testing the cable range against the latest industry oils.

An Economic Alternative

TowerFlex®-S Global is more cost efficient to use for fixed installation than standard Draka WindFlex®. The use in a fixed application allows us to design a cable that is less bulky, with lighter weight and smaller diameter. The results is an easier and less costly installation.

Prysmian Group / Renewable Energy

Global Wind Energy Sales Contacts

Brøndby, Denmark
Phone: +45 23 35 05 06
E-mail: bertil.andersson@draka.com

Pamplona, Spain
Phone: +34 685 484 426
E-mail: victor.romera@draka.com

Wuppertal, Germany
Phone: +49 171 673 8289
E-mail: thomas.brandt@draka.com

North Dighton, MA, USA
Phone: +1 219 766 2960
E-mail: dennis.anweiler@draka.com

Australia & New Zealand
Phone: +61 406 996 234
E-mail: mark.dabbs@draka.com

Suzhou, P.R. of China
Phone: +86 137 0613 6113
E-mail: henry.feng@draka.com

Beijing, P.R. of China
Phone: +86 139 1033 9878
E-mail: kevin.liu@draka.com

Beijing, P.R. of China
Phone: +86 159 1061 8581
E-mail: bomo.li@draka.com.cn

Sorocaba, Brazil
Phone: +55 15 9182 8555
E-mail: fernanda.gaibina@drakacableteq.com.br

Bangalore, India
Phone: +91 932 457 5733
E-mail: dhananjay.karve@ravincables.com

Bangalore, India
Phone: +91 998 691 8697
E-mail: naresh@alltronixin.com

Wind Energy Globally
Phone: +45 40 19 26 31
E-mail: dan.larsen@draka.com

www.drakawind.com

Draka

A brand of the Prysmian Group

Draka

Draka TowerFlex®

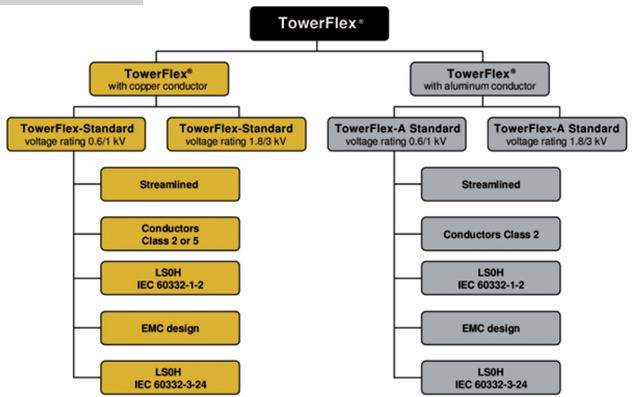
The cable solution for fixed installation in towers

TowerFlex®-S is optionally available with UL Recognition or UL Listed approval.

Draka TowerFlex® Global product family is comprised of two basic cable constructions with several subordinate cable types.

Draka TowerFlex® is specifically designed for fixed installation in towers to replace insulated power cables like NYY and bus bar systems. Draka TowerFlex® program is extensive and include both copper and aluminium conductor versions. With lower weight the latter design allows for easier installation.

Draka TowerFlex® is available with various approvals such as UL Recognition and UL Listing.



Standards and Approvals:
It's important to understand the difference between a Recognized cable UL 758 and a Listed TC cable UL 1277 & UL 44.

The basis of Draka TowerFlex®-S Global is standard IEC 60502-1, which has specified the construction, dimensions and test requirements.

Various options for approvals are available, such as UL Recognition (UL 758) and UL Listing (UL 2277, UL 1277 & UL 44).

Additional enhanced flame resistance according to IEC 60332 -3-24 Category C, is also available.

At Draka we listen to our customer's needs. For that reason we produce TowerFlex®-S in different versions, depending on the wind turbine manufacturer's requirements for a UL Recognized vs UL Listed approval. Just ask us, if you're in doubt!

Main points to consider when choosing which UL approval to use:

- Recognized cables can only be installed in machines. Fixed and flexible mounting allowed. Listed tray cables are allowed for horizontal as well as vertical installation in buildings.
- Flammability requirements are much less severe for a recognized cable. Whereas, Listed Tray Cables are required to resist large scale flame tests.
- Recognized cables can be lighter, due to different design requirements, that allow the use of thinner insulation and jackets. As Listed tray cables are meant to be more "tough", thickness requirements are higher - so that the construction can withstand more severe flame tests.

We know fixed cables

TowerFlex®-S Global 0.6/1 (1.2) kV

Application

This cable is intended for fixed installation in wind turbines. This cable has good resistance to temperature, oils, ozone and flame.

Construction

- Conductor is made of plain copper, stranded wire class 2 acc. to IEC 60228.
- Insulation is made of rubber compound type HEPR acc. to IEC 60502-1.
- Inner covering made of rubber compound type GM1b acc. to DIN VDE 0207.
- Sheath is made of rubber compound type 5GM3 acc. to DIN VDE 0207.
- Sheath colour is black.
- Bending radius for fixed installation 4 x D and for forming out minimum 3 x D.
- Temperature range at minimum surface temperature for fixed installations is -40°C and maximum conductor temperature is +90°C.

TowerFlex®-S Global 0.6/1 (1.2) kV LSOH

Application

Halogen free cable intended for fixed installation in wind turbines, where improved pliability and very good bending behavior is required. This cable has good resistance to temperature, oils, ozone, flame and low smoke emission.

Construction

- Conductor is made of plain copper, fine wire class 5 acc. to IEC 60228.
- Insulation is made of rubber compound type HEPR acc. to IEC 60502-1.
- Inner covering is made of rubber compound type GM1b acc. to DIN VDE 0207.
- Sheath is made of rubber compound type HXM1 acc. to DIN VDE 0266.
- Bending radius for fixed installation is 4 x D and forming out minimum 3 x D.
- Temperature range at minimum surface temperature for fixed installations -40°C and maximum conductor temperature +90°C.

TowerFlex®-S Global 1.8/3 (3.6) kV LSOH

Application

Halogen free cable intended for fixed installation in wind turbines. This cable has good resistance to temperature, oils, ozone and flame. Low smoke emission.

Construction

- Conductor is made of plain copper, stranded wire class 2 acc. to IEC 60228.
- Insulation is made of rubber compound type HEPR acc. to DIN VDE 0207.
- Sheath is made of rubber compound type HXM1 acc. to IEC 60502-1.
- Sheath colour is black.
- Bending radius for fixed installation 4 x D and forming out minimum 3 x D.
- Temperature range at minimum surface temperature for fixed installations -40°C and maximum conductor temperature +90°C.

TowerFlex®-AS Global 0.6/1 (1.2) kV LSOH

Application

Halogen free cable intended for fixed installation in wind turbines. This cable has good resistance to temperature, oils, ozone and flame. Low smoke emission.

Construction

- Conductor is made of aluminium, stranded wire class 2 acc. to IEC 60228.
- Insulation is made of rubber compound type HEPR acc. to IEC 60502-1.
- Inner covering is made of rubber compound type GM1b acc. to DIN VDE 0207.
- Sheath is made of rubber compound type HXM1 acc. to DIN VDE 0266.
- Bending radius for fixed installation is 4 x D and forming out minimum 3 x D, D > 25mm.
- Temperature range at minimum surface temperature for fixed installations -40°C and maximum conductor temperature +90°C.

TowerFlex® Global Cable Specifications

TowerFlex®-S Global 0.6/1 (1.2) kV

Cores x cross-section mm²	Cable diameter mm	Weight kg / km
1 x 120	19 - 22	1310
1 x 150	20 - 23	1601
1 x 185	23 - 26	2024
1 x 240	26 - 29	2605
1 x 300	29 - 32	3224
3 x 70	31 - 34	2936
4 x 70	34 - 37	3753
4 x 95	40 - 44	5291

Note additional cross-sections and number of cores are available on request.

Electrical data

Nominal voltage	0.6/1 kV
Conductor temperature	+90°C
Maximum short circuit temp.	+250°C
Design standard	IEC 60502-1
Behavior on fire acc. to	IEC 60332-1-2
Oil resistance acc. to	IEC 60811-2-1
Ozone resistance acc. to	IEC 60811-2-1
UV resistant	Yes

TowerFlex®-S Global 0.6/1 (1.2) kV LSOH

Cores x cross-section mm²	Cable diameter mm	Weight kg / km
3 x 70	33 - 37	2765
1 x 240	26 - 29	2410
3 x 240	58 - 64	8607

Note additional cross-sections and number of cores are available on request.

Electrical data

Nominal voltage	0.6/1kV
Conductor temperature	+90°C
Maximum short circuit temp.	+250°C
Design standard	IEC 60502-1
Behavior on fire acc. to	IEC 60332-1-2
Smoke density acc. to	IEC 61034-2
Corrosive gases acc. to	IEC DIN EN 50267-2
Oil resistance acc. to	IEC 60811-2-1
Ozone resistance acc. to	IEC 60811-2-1
UV resistant	Yes

TowerFlex®-S Global 1.8/3 (3.6) kV LSOH

Cores x cross-section mm²	Cable diameter mm	Weight kg / km
1 x 185	18.0	2180
1 x 240	20.7	2890

Note additional cross-sections and number of cores are available on request.

Electrical data

Nominal voltage	1.8/3kV
Conductor temperature	+90°C
Maximum short circuit temp.	+250°C
Design standard	IEC 60502-1
Behavior on fire acc. to	IEC 60332-1-2
Smoke density acc. to	IEC 61034-2
Corrosive gases acc. to	IEC DIN EN 50267-2
Oil resistance acc. to	IEC 60811-2-1
Ozone resistance acc. to	IEC 60811-2-1
UV resistant	Yes

TowerFlex®-AS Global 0.6/1 (1.2) kV LSOH

Cores x cross-section mm²	Cable diameter mm	Weight kg / km
1 x 50	11.5 - 14.5	266
1 x 70	13.5 - 16.5	352
1 x 95	15.0 - 18.0	450
1 x 120	16.5 - 19.5	556
1 x 150	18.5 - 21.5	686
1 x 185	21.0 - 24.0	842
1 x 240	24.5 - 27.5	1076
1 x 300	27.5 - 30.5	1299
1 x 400	31.0 - 34.0	1680
3 x 150	42.0 - 46.0	2756
4 x 150	47.0 - 51.0	3367

Note additional cross-sections and number of cores are available on request.

Electrical data

Nominal voltage	0.6/1kV
Conductor temperature	+90°C
Maximum short circuit temp.	+250°C
Design standard	IEC 60502-1
Behavior on fire acc. to	IEC 60332-1-2
Smoke density acc. to	IEC 61034-2
Corrosive gases acc. to	IEC DIN EN 50267-2
Oil resistance acc. to	IEC 60811-2-1
Ozone resistance acc. to	IEC 60811-2-1
UV resistant	Yes