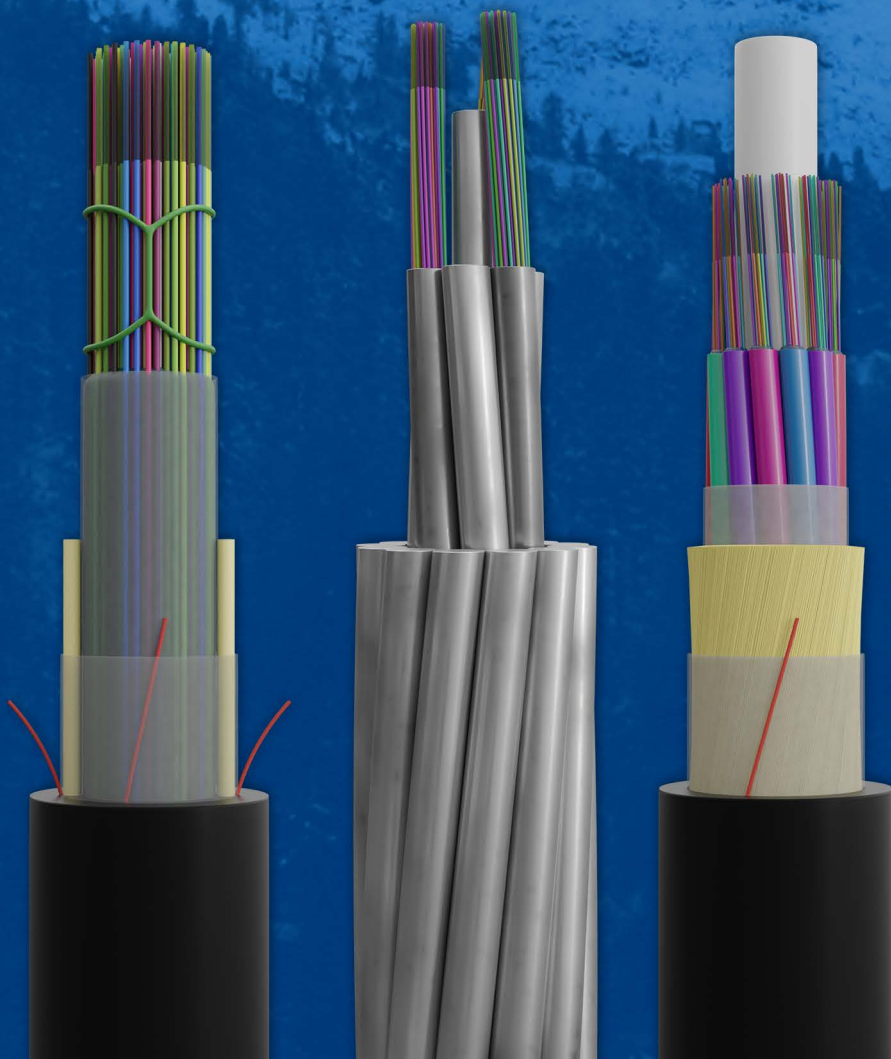


CABLES FOR A MOVING WORLD

TRATOS FIBRE OPTIC[®] SYSTEM



TRATOS FIBRE OPTIC® SYSTEM

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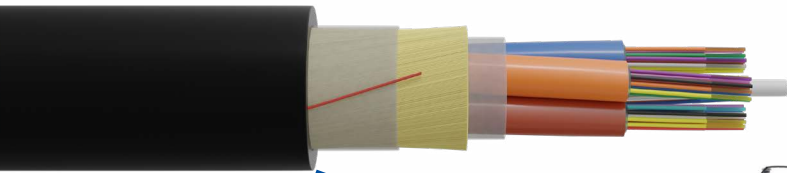
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TRATOS OPGW - OPTICAL GROUND WIRE



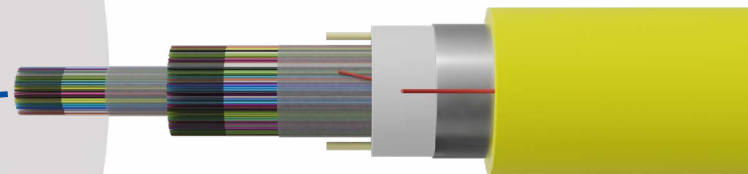
TRATOS ADSS ALL-DIELECTRIC SELF SUPPORTING



TRATOS WRAP SOLUTIONS



TRATOS UNDERGROUND CABLES



TRATOS FIBROPTIC® SYSTEM

STANDARDS AND QUALITY SYSTEM

QUALITY SYSTEM

Tratos aim to work closely with customers to find better, more environmentally friendly solutions to their challenges.

We are committed to our vision and strategy to serve all our internal and external customers by providing high quality services and products. Tratos is an established industry leader in the design, manufacture and supply of cables and products and to maintain this leading position we are committed at every level to providing our customers with quality services and products at a competitive price. As a commercial enterprise we are aware of the importance of satisfying our customers and of the financial impact of which nonconformities may have on our profitability. For these reasons we are committed to complying with all customer requirements and specifications both legal and statutory requirements. Our Quality Management System has been audited and approved by two independent, Internationally recognized and accepted authorities: BSI and AENOR-IQNET (E), in accordance to BS EN ISO 9001:2015 covering the production, purchasing of raw materials design and final test including various document types. The Tratos Quality Management system is under frequent regular surveillance by inspectors working for the Certification Authorities.



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ENVIRONMENTAL SYSTEM

Our Environmental Management System has been audited and approved by two independent, Internationally recognized and accepted authorities:

BSI and AENOR-IQNET (E), in accordance to BS EN ISO 14001:2015 covering the production, purchasing of raw materials design and final test including various document types. The Tratos Quality Management system is under frequent regular surveillance by inspectors working for the Certification Authorities.



ENERGY MANAGEMENT SYSTEMS

By complying with the BS EN ISO 50001:2018 Tratos follows a systematic approach in achieving continual improvement of energy performance and the Energy Management Systems (EnMS).

The BS EN ISO 50001:2018 is a standard issued by the International Standard Organization (ISO) which outlines the requirements for establishing, implementing, maintaining and improving an energy management system (EnMS).



CIRCULAR ECONOMY

The EU Eco-Management and Audit Scheme (EMAS) is a premium management instrument developed by the European Commission for companies and other organisations to evaluate, report, and improve their environmental performance. EMAS is open to every type of organisation eager to improve its environmental performance. It spans all economic and service sectors and is applicable worldwide.



AWARDS

Tratos cables are made with award winning Tratos-JBA® compound. Tratos UK Ltd has won a **Queen's Award for Enterprise - Innovation** for its technologically advanced Tratos-JBA® compound.



STANDARDS AND QUALITY SYSTEM

HEALTHY & SAFETY SYSTEM

Once its decision to create a board post dedicated to furthering best practice for Health and Safety, international cable manufacturer Tratos is celebrating receipt of ISO 45001. ISO 45001 sets out the minimum requirements for occupational health and safety management best practice and helps companies achieve the maximum return for employees, operations and customers.



REACH, WEEE & ROHS



Tratos is fully compliant with the **REACH**. This is a European Union regulation concerning the **Registration, Evaluation, Authorisation and restriction of Chemicals**. It came into force on 1st June 2007 and replaced a number of European Directives and Regulations with a single system. REACH applies to substances manufactured or imported into the EU in quantities of 1 tonne or more per year. Generally, it applies to all individual chemical substances on their own, in preparations or in articles. To summarise, REACH makes the cable industry directly responsible for assessing and managing the risks posed by chemicals and providing safety information to their users.



Tratos fully subscribes to The **Waste Electrical and Electronic Equipment Directive (WEEE Directive)**, introduced into UK law in January 2007 by the Waste Electrical and Electrical Equipment Regulations 2006. The WEEE Directive aims to reduce the amount of electrical and electronic equipment being produced and to encourage everyone to reuse, recycle and recover it. The WEEE Directive also aims to improve the environmental performance of businesses that manufacture, supply, use, recycle and recover electrical and electronic equipment. TRATOS has enlisted the services of the UK's leading producer compliance scheme, Valpak, whom manage our recycling obligations and also ensure our compliance to the WEEE Regulations and the Waste Batteries and Accumulators Regulations.



Tratos is fully compliant with the **Restriction of Hazardous Substances (RoHS) Regulations**. These Regulations implement EU Directive 2011/65/EU which bans the placing on the EU market of new electrical and electronic equipment containing more than agreed levels of lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE) flame retardants. Tratos fully understands the requirements of the RoHS Directive and ensures that our products, and their components, comply.

CORPORATE SOCIAL RESPONSABILITY

Tratos adopts a Code of Ethics which adheres to the United Nations Global Compact on human rights, labour standards, protection of the environment and anti corruption measures.

Under this self regulatory code, Tratos will carry out initiatives in the environmental and social fields with special reference to environmental policies and social policies regarding child labour, compulsory labour, health and security, freedom of association and the right to collective bargaining, discrimination, disciplinary procedures, working hours and wages.

APPROVALS

Reeling cables made by Tratos have been tested and certified by the following Approval Organisations:



Verband Der Elektrotechnik



Instituto Marchio di Qualità



Lloyd's Register Group



Underwriters Laboratories Inc.®



EAC - Eurasian Conformity

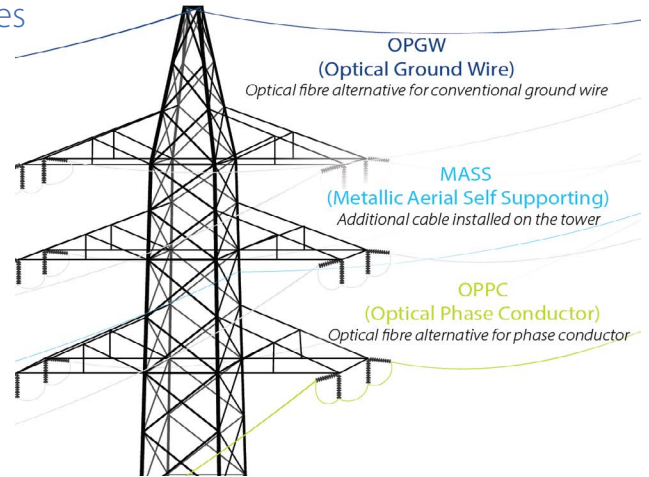


Registro Italiano Navale

TRATOS OPGW OPTICAL GROUND WIRE

Introduction to Metallic Aerial Optical Fibre Cables

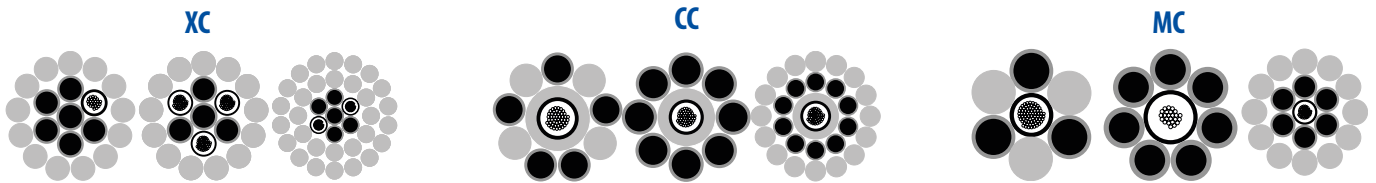
Tratos offers a wide variety of metallic aerial optical fibre cables based on stainless steel tube technology. Tratos metallic cables are designed to suit a range of applications and customer requirements. The cable designs featured in this catalogue represent a range of capabilities but are by no means an exhaustivelist. Many Tratos cables are produced to customer specification and we recommend contacting Tratos for more information when designing a system to suit.



STAINLESS STEEL TUBES

As a manufacturer of stainless steel tubes, Tratos is able to provide the best possible tube for the application, filled with thixotropic filling compound and hermetically sealed to provide optimum protection for enclosed fibres. Each tube is eddy-current checked for holes and damage over the entire length.

CABLE DESIGNS



SPECIFICATIONS	
Aluminium	EN 60889, IEC 60889
Aluminium Alloy	EN 50183, IEC 60104
Aluminium Clad Steel	EN 61232, IEC 61232
Galvanised Steel	EN 50189, IEC 60888

FIBRES

- ITU-T G.651
- ITU-T G.652 (standard diameter and 200µm)
- ITU-T G.654
- ITU-T G.655
- ITU-T G.657
- Other fibre types can be offered upon request

OPGW TYPE IDENTIFICATION

ASLH	D(S)	bb	1	x	48	SMF	(AL3	/	A20SA	92	/	51	-	13.0)
	Tube Design (S) = Steel loose tube	Armouring one b for each armouring	Number of Steel Tubes		Fibre Count	Fibre Type	Type of Aluminium Alloy		Type of Aluminium Clad Steel	Cross Section of Aluminium Alloy		Cross Section of Aluminium Clad Steel		Nominal Short Current
	(SA)= Aluminium clad steel													

TRATOS FIBRE OPTIC® SYSTEM

OPGW CABLES according to standards

TRATOS® OPGW HC

TratosHC optical cable houses and protects the optical fibres within gel-filled stainless steel tubes.

Aluminium-clad steel and aluminium or aluminium alloy, wires are stranded with the tubes to create a multi-layer design suitable for a variety of applications such as OPGW and OPSC substitution.

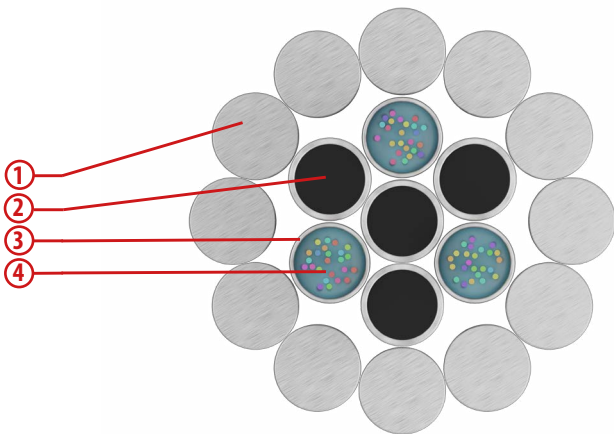
FEATURES AND PERFORMANCES

CONSTRUCTION

- 1) Aluminium alloy wire
- 2) Aluminium clad steel wire
- 3) Stainless steel tube
- 4) Optical fibres

TECHNICAL SPECIFICATIONS

- Optical fibres placed in stranded stainless steel tubes
- Fibre excess length in OPGW $\geq 0,5\%$
- Stainless steel tubes are gel filled for water resistance and shock absorption
- High fibre counts in several steel tubes (144 fibres or more)
- Natural rope-like design very similar to ACSR
- Easy substitution of ACSR ground wires with similar diameter and weight
- No anti-rotation devices required for installation
- Fully metallic design





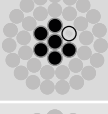
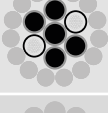
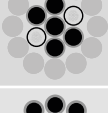
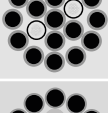
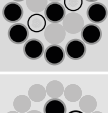
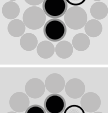
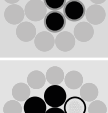
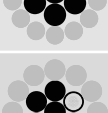
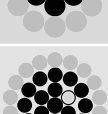
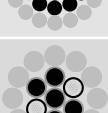
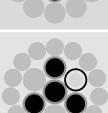

Working Ambient Temperature:

Installation - 30°C to + 50°C

In operation - 60°C to + 85°C

Equivalent ACSR to EN 50182	OPGW Type	Maximum Fibre Count	Cross Section	Diameter mm	RTS (kN)	Weight (kg/km)	Short Current kA (20-200°C, 1s)
50/30	ASLH-D(S)bb 1 x 24 SMF (AL3/A20SA 52/30 – 7.4)	24		12.1	53.3	365	7.4
95/55	ASLH-D(S)bb 1 x 48 SMF (AL3/A20SA 92/51 – 13.0)	48		16.0	91.5	633	13.0
120/70	ASLH-D(S)bb 2 x 48 SMF (AL3/A20SA 122/51 – 16.3)	96		18.0	97.4	741	16.3

TRATOS® OPGW HC

Equivalent ACSR to EN 50182	OPGW Type	Maximum Fibre Count	Cross Section	Diameter	RTS	Weight	Short Current
				mm	(kN)	(kg/km)	kA (20-200°C, 1s)
210/50	ASLH-D(S)bbb 2 x 36 SMF (AL3/A20SA212/36-25.0)	72		21.1	108.2	879	25.0
Horse	ASLH-D(S)bb 2 x 24 SMF (AL4 / A20SA 71/30 - 9.5)	60		13.9	61.5	442	9.5
Keziah	ASLH-D(S)bbb 1 x 24 SMF (AL3 / A20SA 197/46 - 24.0)	36		20.6	116.4	884	24.0
Dotterel	ASLH-D(S)bb 2 x 48 SMF (AL3 / A20SA 74/42 - 10.5)	96		14.9	75.3	543	10.5
Atle	ASLH-D(S)bb 2 x 48 SMF (AL4 / A20SA 136/57 - 18.1)	120		19.1	110.9	830	18.1
Gondul	ASLH-D(S)bb 2 x 48 SMF (27SA 174 - 13.5)	96		18.2	178.4	1,114	13.5
Sveid	ASLH-D(S)bb 2 x 48 SMF (AL4 / A20SA 55/180 - 17.0)	144		21.0	221.5	1,435	17.0
Sustrong	ASLH-D(S)bb 1 x 48 SMF (AL2 / A20SA 99/26 - 12.2)	48		15.0	64.7	483	12.2
Dorking	ASLH-D(S)bb 1 x 48 SMF (AL3 / A20SA 100/43 - 13.5)	48		16.0	83.5	603	13.5
THYM 107	ASLH-D(S)bb 1 x 48 SMF (AL4 / ST6C 80/51 - 11.0)	48		15.4	96.6	662	11.0
THYM 157	ASLH-D(S)bb 1 x 48 SMF (AL4 / ST6C 133/67 - 17.3)	64		18,9	131,8	948	17,3
THYM 268	ASLH-D(S)bbb 1 x 48 SMF (AL4 / ST6C 149/151 - 22.3)	48		23,0	256,4	1653	22,3
TT-1,7 70	ASLH-D(S)bb 2 x 24 SMF (AL3 / A20SA 59/25 - 7.9)	48		12,6	49,1	368	7,8
TT-1,7 95	ASLH-D(S)bb 1 x 48 SMF (AL3 / A20SA 90/35 - 11.8)	48		15,0	69,9	516	11,8

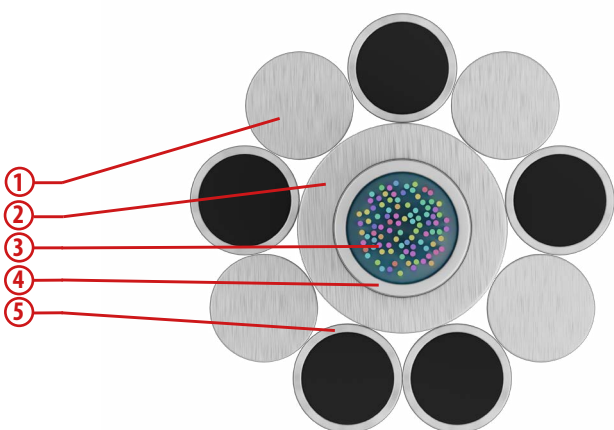
TRATOS FIBRE OPTIC® SYSTEM

OPGW CABLES according to standards

TRATOS® OPGW CC

TratosCC optical cable houses and protects the optical fibres within a central gel-filled stainless steel tube inside an aluminium pipe. Aluminium-clad steel and aluminium alloy wires are stranded around the central element in single or multiple layers.

FEATURES AND PERFORMANCES



CONSTRUCTION

- 1) Aluminium alloy wire
- 2) Aluminium pipe
- 3) Optical Fibres
- 4) Stainless steel tube
- 5) Aluminium-clad steel

TECHNICAL SPECIFICATIONS

- Optical fibres placed in central aluminium-clad stainless steel tube
- Fibre counts up to 96
- Stainless steel tube is gel filled for water resistance and shock absorption
- Excellent protection of optical fibres
- Excellent crush resistance and high fault current rating capability
- Compact design with good diameter/cross section relation
- Fully metallic design
- Available as single or multi-layer design



Working Ambient Temperature:

Installation	- 30°C to + 50°C
In operation	- 40°C to + 85°C

OPGW Type	Maximum Fibre Count	Cross Section	Diameter mm	RTS (kN)	Weight (kg/km)	Short Current kA (20-200°C, 1s)
ASLH-D(SA)b 48 SMF (AL3 / A20SA 25/31 - 6.1)	48		11.2	46.5	340	6.1
ASLH-D(SA)b 36 SMF (AL3 / A20SA 33/33 - 7.3)	36		12.0	52.0	376	7.3
ASLH-D(SA)b 48 SMF (AL3 / A20SA 21/42 - 6.8)	48		12.0	60.2	419	6.8

TRATOS® OPGW CC

OPGW Type	Maximum Fibre Count	Cross Section	Diameter mm	RTS (kN)	Weight (kg/km)	Short Current kA (20-200°C, 1s)
ASLH-D(SA)b 48 SMF (27SA 62 - 7.1)	48		12.1	63.2	461	7.1
ASLH-D(SA)b 96 SMF (A20SA 64 - 5.8)	96		12.3	81.2	515	5.8
ASLH-D(SA)b 48 SMF (AL4 / A20SA 43/34 - 9.2)	48		13.1	56.9	436	9.2
ASLH-D(SA)b 48 SMF (A20SA 81 - 6.9)	48		13.2	101.3	621	6.9
ASLH-D(SA)bb 48 SMF (AL4 / A20SA 68/43 - 11.4)	48		14.7	78.2	537	11.4
ASLH-D(SA)bb 48 SMF (AL4 / A20SA 79/49 - 13.3)	48		15.8	90.0	617	13.3
ASLH-D(SA)bb 36 SMF (AL3 / A20SA 92/44 - 13.8)	36		16.0	83.3	601	13.8
ASLH-D(SA)bb 96 SMF (AL4 / A20SA 75/50 - 13.2)	96		16.0	87.8	16.0	13.2
ASLH-D(SA)bb 48 SMF (AL4 / A20SA 85/53 - 14.4)	48		16.4	95.2	667	14.4
ASLH-D(SA)bb 72 SMF (AL3 / A20SA 95/59 - 15.9)	72		17.3	103.6	745	15.9
ASLH-D(SA)bb 48 SMF (AL4 / A20SA 97/70 - 16.9)	48		17.9	120.9	819	16.9
ASLH-D(SA)bb 96 SMF (AL4 / A20SA 106/66 - 17.4)	96		18.3	120.2	825	17.4

TRATOS FIBRE OPTIC® SYSTEM

OPGW CABLES according to standards

TRATOS® OPGW MC

Tratos MC optical cable houses and protects the optical fibres within a central gel-filled stainless steel tube. Aluminium-clad steel and aluminium alloy wires are stranded around the central element in single or multiple layers.

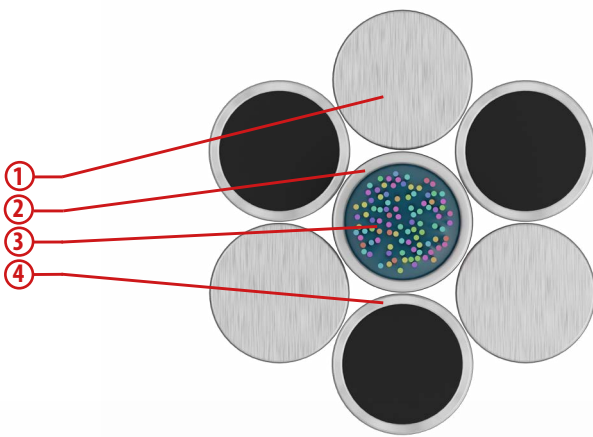
FEATURES AND PERFORMANCES

CONSTRUCTION

- 1) Aluminium alloy wire
- 2) Stainless steel tube
- 3) Optical fibres
- 4) Aluminium clad steel wire

TECHNICAL SPECIFICATIONS

- Optical fibres placed in central stainless steel tube
- Fibre counts up to 96
- Stainless steel tube is gel filled for water resistance and shock absorption
- Compact design with good diameter/cross section relation
- Fully metallic design
- Available as single or multi-layer design



Working Ambient Temperature:

Installation	- 30°C to + 50°C
In operation	- 40°C to + 85°C

Typical Single Layer Designs

OPGW Type	Maximum Fibre Count	Cross Section	Diameter mm	RTS (kN)	Weight (kg/km)	Short Current kA (20-200°C, 1s)
ASLH-D(S)b 24 SMF (27SA 34 - 3.2)	30		8.3	35.3	229	3.3
ASLH-D(S)b 48 SMF (27SA 58 - 5.3)	48		10.5	59.2	374	5.3
ASLH-D(S)b 48 SMF (27SA 58 - 5.3)	72		12.0	77.4	490	6.9
ASLH-D(S)b 48 SMF (AL3 / A20SA 29/29 - 5.3)	48		10.5	43.3	300	5.3
ASLH-D(S)b 48 SMF (AL4 / 27SA 31/31 - 5.8)	48		10.8	40.9	296	5.8
ASLH-D(S)b 48 SMF (AL3 / A20SA 33/33 - 6.0)	60		11.3	49.1	345	6.0

TRATOS® OPGW MC

OPGW Type	Maximum Fibre Count	Cross Section	Diameter mm	RTS (kN)	Weight (kg/km)	Short Current kA (20-200°C, 1s)
ASLH-D(S)b 72 SMF (AL4 / 27SA 38/38 - 7.2)	72		12.0	50.6	367	7.2
ASLH-D(S)b 96 SMF (AL3 / A20SA 25/25 - 4.5)	96		10.2	38.6	278	4.5
ASLH-D(S)b 96 SMF (27SA 51 - 4.3)	96		10.4	52.4	355	4.3
ASLH-D(S)b 96 SMF (A20SA 67 - 5.2)	96		11.6	81.3	498	5.2

Typical Double Layer Designs

OPGW Type	Maximum Fibre Count	Cross Section	Diameter mm	RTS (kN)	Weight (kg/km)	Short Current kA (20-200°C, 1s)
ASLH-D(S)bb 48 SMF (AL3 / A20SA 96/29 - 12.1)	48		15.0	64.8	494	12.1
ASLH-D(S)bb 48 SMF (AL3 / A20SA 120/35 - 15.1)	72		16.7	80.4	614	15.1
ASLH-D(S)bb 48 SMF (AL4 / A20SA 63/39 - 9.2)	48		13.6	70.2	468	9.2
ASLH-D(S)bb 96 SMF (AL4 / A20SA 65/39 - 9.4)	96		14.0	70.8	493	9.4
ASLH-D(S)bb 48 SMF (AL4 / A20SA 78/82 - 13.4)	48		16.8	120.7	806	13.4
ASLH-D(S)bb 96 SMF (AL4 / A20SA 78/76 - 13.0)	96		16.8	120.3	782	13.0
ASLH-D(S)bb 48 SMF (AL4 / A20SA 201/25 - 23.2)	72		20.0	90.7	774	23.2
ASLH-D(S)bb 48 SMF (AL3 / A20SA 92/49 - 12.9)	72		16.0	90.1	632	12.9
ASLH-D(S)bb 48 SMF (AL3 / A20SA 122/61 - 16.9)	48		18.0	109.7	785	16.9
ASLH-D(S)bb 48 SMF (AL3 / A20SA 208/42 - 24.9)	72		21.0	107.9	906	24.9

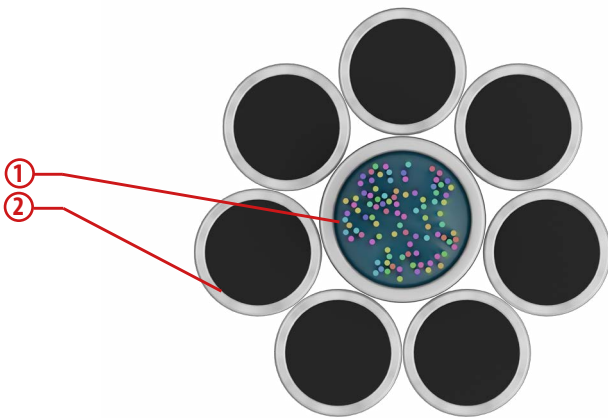
TRATOS FIBRE OPTIC® SYSTEM

OPGW CABLES according to standards

TRATOS® METALLIC AERIAL SELF-SUPPORTING CABLE (MASS)

Metallic Aerial Self-Supporting (MASS) cable is an alternative solution used for installing optical cable on medium and high voltage power lines. It is typically used when existing phase or ground wire replacement is not possible or uneconomical. MASS cable is a compact, light-weight solution with no electrical function, designed to provide a telecommunications path without interfering with the existing power lines or infrastructure. Its small size helps minimise loading on towers and poles, yet it is completely self-supporting to meet sag and tension requirements. It is typically installed in “under build” applications beneath the live phases.

FEATURES AND PERFORMANCES



CONSTRUCTION

- 1) Central stainless steel loose tube
- 2) Aluminium clad steel wire

TECHNICAL SPECIFICATIONS

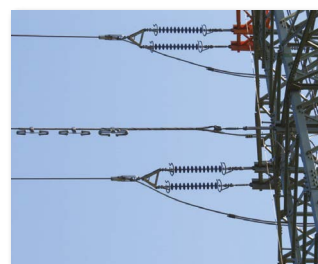
- Central stainless steel loose tube design
- Typical diameter between 9 and 12 mm
- Fibre counts up to 96
- No voltage limit – suitable for medium and high voltage lines
- Suitable for use on lines without a ground wire
- Convenient means to add fibre where OPGW is already installed
- Deployed in regions with high lightning activity
- Can be installed without an outage
- Small cable size limits additional structural loading
- Suitable for wooden poles with universal attachment
- Aluminium Clad, Aluminium Alloy or Galvanised
- Steel wire options available depending on mechanical properties required



OPGW Type	Maximum Fibre Count	Cross Section	Diameter mm	RTS (kN)	Weight (kg/km)
ASLH-D(S)b 24 SMF (A20SA 28 - 2.4)	24		7,5	35,4	207
ASLH-D(S)b 24 SMF (A20SA 42 - 3.6)	24		9,0	54,0	303
ASLH-D(S)b 30 SMF (A20SA 34 - 2.9)	30		8,3	43,7	253
ASLH-D(S)b 30 SMF (A20SA 50 - 4.2)	30		9,8	63,4	355

TRATOS® METALLIC AERIAL SELF-SUPPORTING CABLE (MASS)

OPGW Type	Maximum Fibre Count	Cross Section	Diameter mm	RTS (kN)	Weight (kg/km)
ASLH-D(S)b 36 SMF (A20SA 37 - 3.1)	36		8,6	47,3	275
ASLH-D(S)b 36 SMF (A20SA 54 - 4.6)	36		10,2	67,8	391
ASLH-D(S)b 48 SMF (A20SA 40 - 3.4)	48		9,0	51,0	298
ASLH-D(S)b 48 SMF (A20SA 58 - 4.9)	48		10,5	69,6	414
ASLH-D(S)b 60 SMF (A20SA 45 - 3.8)	60		9,5	56,8	331
ASLH-D(S)b 60 SMF (A20SA 66 - 5.6)	60		11,3	78,7	475
ASLH-D(S)b 72 SMF (A20SA 49 - 4.2)	72		10,0	63,0	369
ASLH-D(S)b 72 SMF (A20SA 75 - 6.4)	72		12,0	86,7	542
ASLH-D(S)b 96 SMF (A20SA 51 - 4.3)	96		10,3	65,0	388
ASLH-D(S)b 96 SMF (A20SA 67 - 5.7)	96		11,6	81,3	498



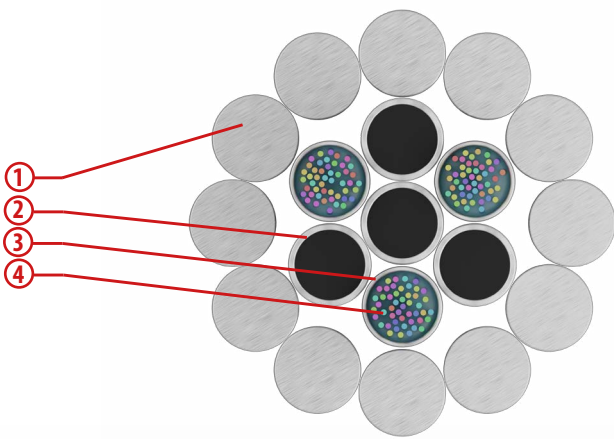
TRATOS FIBRE OPTIC® SYSTEM

OPGW CABLES according to standards

TRATOS® OPTICAL PHASE CONDUCTOR (OPPC)

Optical Phase Conductor (OPPC) is used as an alternative telecommunications solution when there is no existing ground wire, meaning Optical Ground Wire (OPGW) is not a viable option. The basic construction is similar to conventional OPGW, only it is designed to simulate the mechanical and electrical characteristics of the phase wire it replaces. Unlike OPGW, where the cable is not carrying continuous current, OPPC is energised along high voltage power lines. Therefore it requires specially adapted splice boxes and insulators to accommodate the live line conditions. AFL can design a cable to accommodate your precise application. To do so, we need the properties of the phase conductor you are seeking to replace. With that, we can do the rest.

FEATURES AND PERFORMANCES



CONSTRUCTION

- 1) Aluminium alloy wire
- 2) Aluminium clad steel wire
- 3) Stainless steel tube
- 4) Optical fibres

TECHNICAL SPECIFICATIONS




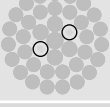
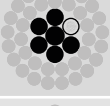
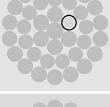
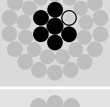
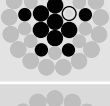
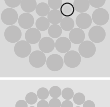
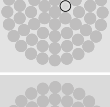
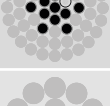
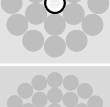
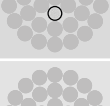

- Engineered to match existing conductors
- Available in fibre counts up to 144
- Distribution or transmission – from 36 to 245 kV
- Suitable for any type of optical fibre, single-mode or multi-mode
- Designed to match electrical properties of conductor it replaces
- Uses standard fibre optic dead ends and suspension grips



OPPC HARDWARE

A full range of insulators and joint boxes are available to suit customer specifications. Please refer to the Accessories section of this catalogue

TRATOS® OPTICAL PHASE CONDUCTOR (OPPC)

Equivalent ACSR to EN 50182	OPGW Type	Maximum Fibre Count	Cross Section	Diameter	RTS	Weight	Short Current
				mm	(kN)	(kg/km)	kA (20-200°C, 1s)
70/12	ASLH-D(S)bb 1 x 24 SMF (AL1 / A20SA 66/15 - 8.1)	24		12.1	30.1	307	301
95/15	ASLH-D(S)bb 2 x 24 SMF (AL1 / A20SA 90/12 - 10.4)	60		13.9	29.5	370	357
120/20	ASLH-D(S)bb 1 x 48 SMF (AL1 / A20SA 114/25 - 13.8)	48		15.8	49.6	519	422
ASTER 228	ASLH-D(S)bbb 2 x 24 SMF (AL4 226 - 23.8)	72		20.2	73.6	676	561
PASTEL 228	ASLH-D(S)bbb 1 x 48 SMF (AL4 / ST6C 180/52 - 21.2)	48		20.2	121.6	930	502
ASTER 288	ASLH-D(S)bbb 1 x 48 SMF (AL4 288 - 30.3)	48		22.4	93.5	833	641
PASTEL 288	ASLH-D(S)bbb 1 x 48 SMF (AL4 / ST6C 237/51 - 27.2)	48		22.4	155.1	1097	581
PASTEL 412	ASLH-D(S)bbb 1 x 48 SMF (AL4 / A20SA 288/117 - 37.3)	64		26.5	224.3	1660	726
ASTER 366	ASLH-D(S)bbb 1 x 48 SMF (AL4 374 - 39.3)	48		25.5	118.2	1069	758
ASTER 570	ASLH-D(S)bbbb 1 x 48 SMF (AL4 578 - 60.8)	48		31.6	187.7	1650	988
PETUNIA 612	ASLH-D(S)bbbb 1 x 48 SMF (AL4 / A20SA 489/123 - 58.8)	64		32.5	309.1	2247	944
ELM	ASLH-D(S)bb 48 SMF (AL3 210 - 22.6)	60		19.3	61.8	628	544
Poplar	ASLH-D(S)bbb 3 x 32 SMF (AL5 240 - 25.9)	96		21.0	70.9	731	599
UPAS	ASLH-D(S)bbb 48 SMF (AL3 366 - 39.5)	48		25.2	108.1	1063	771

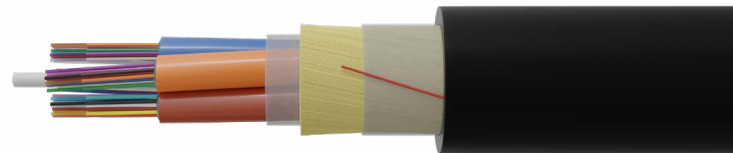
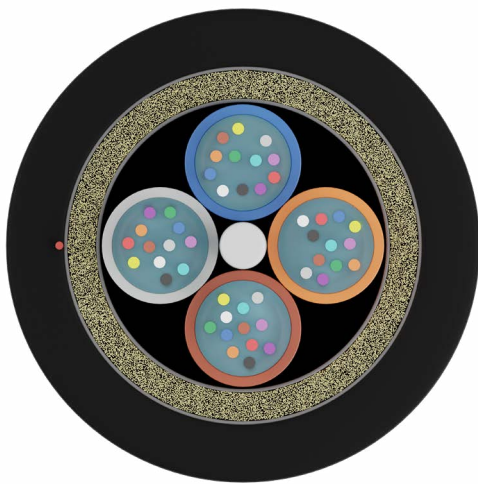
TRATOS ADSS ALL-DIELECTRIC SELF SUPPORTING

TRATOS ADSS MS®

Tratos MS All-Dielectric Self-Supporting (ADSS) cable is designed for outside plant aerial and duct applications in local and campus network loop architectures. From pole-to-build to town-to-town installations, the TMS cabling system, which includes cables, suspension, dead end and termination enclosures, offers a comprehensive transmission circuit infrastructure with proven, high reliability performance. As the ADSS cabling concept implies, a separate messenger support wire hanging system is not required, greatly reducing installation time and improving upfront and maintenance labour costs.

TMS includes fibre counts up to 96 optical fibres and any type or combination of single-mode and laser-optimised multi-mode fibres with the cable. Pole-to-Pole span lengths range from 15 metres to over 300 metres.

FEATURES AND PERFORMANCES



Working Ambient Temperature:	
Installation	- 30°C to + 70°C
In operation	- 40°C to + 70°C

INSTALLATION INFORMATION

CABLE	NESC SPANS (@ 1.5% INITIAL SAG) METRES			MAX. SAGGING TENSION N	MAX. LOADING OPERATING TENSION N	MIN. BENDING RADIUS (DYNAMIC) CM	MIN. BENDING RADIUS (STATIC) CM
	LIGHT	MEDIUM	HEAVY				
TMS 383	137	91	55	814	1,785	20	10

CABLE	NESC SPANS (@ 1% INITIAL SAG) METRES			MAX. SAGGING TENSION N	MAX. LOADING OPERATING TENSION N	MIN. BENDING RADIUS (DYNAMIC) CM	MIN. BENDING RADIUS (STATIC) CM
	LIGHT	MEDIUM	HEAVY				
TMS 424	183	134	84	1,886	3,145	22	11
TMS 535	320	259	175	5,809	7,936	27	14

OPTICAL INFORMATION

CABLE	MAXIMUM ATTENUATION (db/km)			BANDWIDTH (MHz·km)		
	SINGLE-MODE (1310 nm/1550 nm)	MULTI-MODE *62.5/125 µm (850 nm/1300 nm)	MULTI-MODE 50/125 µm (850 nm/1300 nm)	SINGLE-MODE (1310 nm/1550 nm)	MULTI-MODE *62.5/125 µm (850 nm/1300 nm)	MULTI-MODE 50/125 µm (850 nm/1300 nm)
TMS 383						
TMS 424	0.35/0.25	3.5/1.2	2.9/0.9	n/a	200/600	500/500
TMS 535						

* All 62.5/125 µm multi-mode ADSS cable transmission performances meet or exceed FDDI requirements. Premium transmission performance fibres available on request.

TRATOS FIBRE OPTIC® SYSTEM

TRATOS ADSS MS®

MECHANICAL DATA

CABLE	FIBRE COUNT	NOMINAL DIAMETER MM	NOMINAL WEIGHT KG/KM	MAXIMUM LENGTHS*	
				SINGLE-MODE METRES	MULTI-MODE METRES
TMS 383	2-48	9.7	72	10,000	8,000
TMS 424	2-60	10.8	84	10,000	8,000
TMS 535	2-96	13.6	148	10,000	8,000

* Longer lengths may be available upon request.

ORDERING INFORMATION

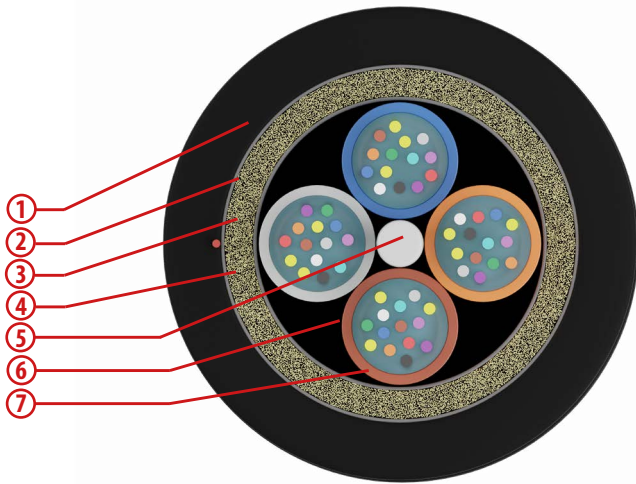
CABLE	FIBRE COUNT	FIBRES PER TUBE	NUMBER OF TUBES / FIBRES	AFL NO.		
				SINGLE-MODE	MULTI-MODE 62.5/125	MULTI-MODE 50/125
TMS 383	6	6	1 w/6 (3 fillers)	AE0069C420AA0	AE0066C420AA0	AE0065C420AA0
	12	12	1 w/12 (3 fillers)	AE0129C420AA0	AE0126C420AA0	AE0125C420AA0
	18	12	1 w/12, 1 w/6 (2 fillers)	AE0189C420AA0	AE0186C420AA0	AE0185C420AA0
	24	12	2 w/12 (2 fillers)	AE0249C420AA0	AE0246C420AA0	AE0245C420AA0
	30	12	2 w/12, 1 w/6 (1 filler)	AE0309C420AA0	AE0306C420AA0	AE0305C420AA0
	36	12	3 w/12 (1 filler)	AE0369C420AA0	AE0366C420AA0	AE0365C420AA0
	48	12	4 w/12	AE0489C420AA0	AE0486C420AA0	AE0485C420AA0
TMS 424	6	6	1 w/6 (4 fillers)	AE0069C520AA4	AE0066C520AA4	AE0065C520AA4
	12	12	1 w/12 (4 fillers)	AE0129C520AA4	AE0126C520AA4	AE0125C520AA4
	18	12	1 w/12, 1 w/6 (3 fillers)	AE0189C520AA4	AE0186C520AA4	AE0185C520AA4
	24	12	2 w/12 (3 fillers)	AE0249C520AA4	AE0246C520AA4	AE0245C520AA4
	30	12	2 w/12, 1 w/6 (2 fillers)	AE0309C520AA4	AE0306C520AA4	AE0305C520AA4
	36	12	3 w/12 (2 fillers)	AE0369C520AA4	AE0366C520AA4	AE0365C520AA4
	48	12	4 w/12 (1 filler)	AE0489C520AA4	AE0486C520AA4	AE0485C520AA4
TMS 535	60	12	5 w/12 (no fillers)	AE0609C520AA4	AE0606C520AA4	AE0605C520AA4
	6	6	1 w/6 (7 fillers)	AE0069C820EA7	AE0066C820EA7	AE0065C820EA7
	12	12	1 w/12 (7 fillers)	AE0129C820EA7	AE0126C820EA7	AE0125C820EA7
	18	12	1 w/12, 1 w/6 (6 fillers)	AE0189C820EA7	AE0186C820EA7	AE0185C820EA7
	24	12	2 w/12 (6 fillers)	AE0249C820EA7	AE0246C820EA7	AE0245C820EA7
	30	12	2 w/12, 1 w/6 (5 fillers)	AE0309C820EA7	AE0306C820EA7	AE0305C820EA7
	36	12	3 w/12 (5 fillers)	AE0369C820EA7	AE0366C820EA7	AE0365C820EA7
	48	12	4 w/12 (4 fillers)	AE0489C820EA7	AE0486C820EA7	AE0485C820EA7
	60	12	5 w/12 (3 fillers)	AE0609C820EA7	AE0606C820EA7	AE0605C820EA7
	72	12	6 w/12 (2 fillers)	AE0729C820EA7	AE0726C820EA7	AE0725C820EA7
	84	12	7 w/12 (1 filler)	AE0849C820EA7	AE0846C820EA7	AE0845C820EA7
	96	12	8 w/12 (no fillers)	AE0969C820EA7	AE0966C820EA7	AE0965C820EA7

Contact customer service for price and availability. Non-zero dispersion-shifted fibres are also available

TRATOS ADSS MS®

SAG AND TENSION INFORMATION

CABLE	SPAN Meters	INITIAL SAG %	INITIAL TENSION N	NESC LIGHT LOADING		NESC MEDIUM LOADING		NESC HEAVY LOADING	
				SAG %	TENSION N	SAG %	TENSION N	SAG %	TENSION N
TMS 383	15	1.5	89	0.5	337	2.2	482	3.2	717
	23	1.5	133	0.5	457	2.4	648	3.6	956
	30	1.5	182	0.6	568	2.6	798	4.0	1,171
	38	1.5	227	0.6	671	2.8	938	4.2	1,370
	46	1.5	271	0.6	768	2.9	1,070	4.5	1,558
	53	1.5	316	0.6	862	3.0	1,196	4.7	1,736
	61	1.5	360	0.7	952	3.2	1,317	-	-
	69	1.5	405	0.7	1,040	3.3	1,434	-	-
	76	1.5	449	0.7	1,125	3.4	1,547	-	-
	84	1.5	498	0.7	1,209	3.5	1,657	-	-
	91	1.5	543	0.7	1,290	3.5	1,765	-	-
	99	1.5	587	0.8	1,370	-	-	-	-
	107	1.5	632	0.8	1,448	-	-	-	-
	114	1.5	676	0.8	1,525	-	-	-	-
	122	1.5	721	0.8	1,601	-	-	-	-
	130	1.5	765	0.8	1,676	-	-	-	-
137	1.5	814	0.8	1,750	-	-	-	-	



4 POSITION 323 OR 383

CONSTRUCTION

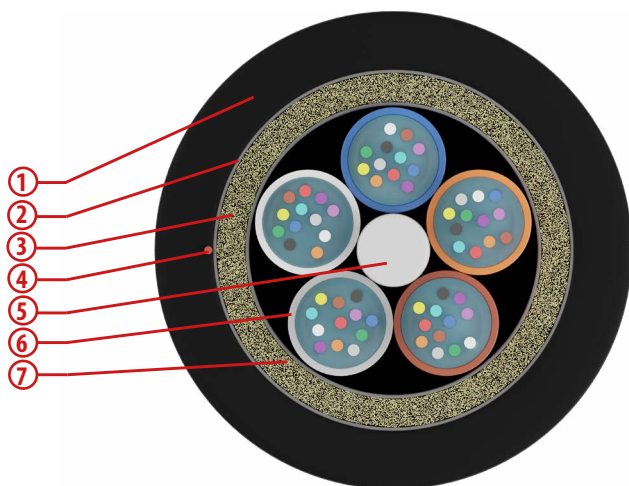
- 1) Polyethylene outer jacket
- 2) Tape
- 3) Torque balanced aramid
- 4) Ripcord
- 5) FRP central member
- 6) Gel-filled loose buffer tube with optical fibres
- 7) Water-blocking system

TRATOS FIBRE OPTIC® SYSTEM

TRATOS ADSS MS®

SAG AND TENSION INFORMATION

CABLE	SPAN Meters	INITIAL SAG %	INITIAL TENSION N	NESC LIGHT LOADING		NESC MEDIUM LOADING		NESC HEAVY LOADING	
				SAG %	TENSION N	SAG %	TENSION N	SAG %	TENSION N
TMS 424	15	1.0	156	0.4	463	1.7	632	2.6	921
	23	1.0	236	0.4	632	1.9	850	3.0	1,223
	30	1.0	316	0.5	783	2.1	1,095	3.2	1,499
	38	1.0	391	0.5	925	2.2	1,228	3.4	1,757
	46	1.0	472	0.5	1,059	2.4	1,401	3.6	1,997
	53	1.0	552	0.5	1,192	2.5	1,570	3.8	2,229
	61	1.0	627	0.6	1,317	2.6	1,730	4.0	2,447
	69	1.0	707	0.6	1,441	2.7	1,886	4.1	2,660
	76	1.0	787	0.6	1,561	2.7	2,037	4.2	2,869
	84	1.0	863	0.6	1,681	2.8	2,184	4.3	3,069
	91	1.0	943	0.6	1,737	2.8	2,331	-	-
	99	1.0	1,023	0.6	1,908	2.9	2,473	-	-
	107	1.0	1,099	0.6	2,024	3.0	2,611	-	-
	114	1.0	1,179	0.6	2,131	3.0	2,749	-	-
	122	1.0	1,259	0.6	2,242	3.1	2,882	-	-
	130	1.0	1,334	0.7	2,349	3.1	3,016	-	-
	137	1.0	1,415	0.7	2,455	3.2	3,016	-	-
	145	1.0	1,495	0.7	2,562	-	-	-	-
	152	1.0	1,570	0.7	2,669	-	-	-	-
	160	1.0	1,650	0.7	2,771	-	-	-	-
168	1.0	1,730	0.7	2,874	-	-	-	-	
175	1.0	1,806	0.7	2,976	-	-	-	-	
183	1.0	1,886	0.7	3,078	-	-	-	-	



5 POSITION 424

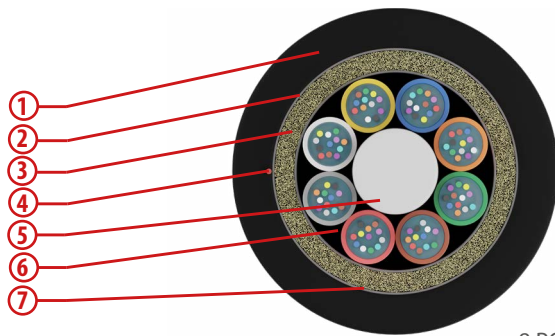
CONSTRUCTION

- 1) Polyethylene outer jacket
- 2) Tape
- 3) Torque balanced aramid
- 4) Ripcord
- 5) FRP central member
- 6) Gel-filled loose buffer tube with optical fibres
- 7) Water-blocking system

TRATOS ADSS MS®

SAG AND TENSION INFORMATION

CABLE	SPAN Meters	INITIAL SAG %	INITIAL TENSION N	NESC LIGHT LOADING		NESC MEDIUM LOADING		NESC HEAVY LOADING	
				SAG %	TENSION N	SAG %	TENSION N	SAG %	TENSION N
TMS 535	15	1	276	0.4	713	1.5	918	2.1	1,319
	30	1	552	0.5	1,220	1.7	1,542	2.5	2,176
	46	1	832	0.6	1,670	1.9	2,087	2.8	2,915
	61	1	1,108	0.6	2,088	2.1	2,590	3.1	3,588
	76	1	1,383	0.6	2,486	2.2	3,063	3.3	4,217
	91	1	1,659	0.6	2,868	2.3	3,515	3.4	4,813
	107	1	1,935	0.7	3,239	2.4	3,951	3.6	5,384
	122	1	2,211	0.7	3,601	2.5	4,374	3.7	5,935
	137	1	2,491	0.7	3,956	2.5	4,785	3.8	6,469
	152	1	2,767	0.7	4,304	2.6	5,188	3.9	6,988
	168	1	3,043	0.7	4,647	2.7	5,583	4.0	7,495
	175	1	3,180	0.7	4,817	2.7	5,778	4.1	7,745
	183	1	3,318	0.7	4,985	2.7	5,971	-	-
	198	1	3,594	0.8	5,320	2.8	6,353	-	-
	213	1	3,870	0.8	5,650	2.8	6,730	-	-
	229	1	4,150	0.8	5,978	2.8	7,102	-	-
	244	1	4,426	0.8	6,303	2.9	7,469	-	-
	259	1	4,702	0.8	6,625	2.9	7,833	-	-
	274	1	4,978	0.8	6,945	-	-	-	-
	290	1	5,253	0.8	7,263	-	-	-	-
305	1	5,529	0.8	7,579	-	-	-	-	
320		5,809	0.8	7,894	-	-	-	-	



8 POSITION 535

CONSTRUCTION

- 1) Polyethylene outer jacket
- 2) Tape
- 3) Torque balanced aramid
- 4) Ripcord
- 5) FRP central member
- 6) Gel-filled loose buffer tube with optical fibres
- 7) Water-blocking system

REEL INFORMATION

REEL SPECIFICATIONS	REEL A	REEL B	REEL C	REEL D	REEL E
ITEM	CM	CM	CM	CM	CM
Reel Height	106.7	147.3	167.6	182.8	213.4
Reel Width Outside	91.4	96.5	106.7	106.7	101.6
Reel Width Inside	81.6	81.3	91.4	91.4	86.4
Drum Diameter	58.7	71.1	91.4	91.4	88.9
Arbor Hole Diameter	7.9	7.9	7.9	7.9	7.9
Reel Weight with Lagging	82 kg	191 kg	311 kg	320 kg	431 kg
MAXIMUM CABLE LENGTH (FEET/METRES)					
Mini-Span 383	3,300 m	7,700 m	10,000 m	-	-
Mini-Span 424	2,700 m	6,200 m	8,000 m	10,000 m	-
Mini-Span 535	1,675 m	3,900 m	5,250 m	6,920 m	10,000 m

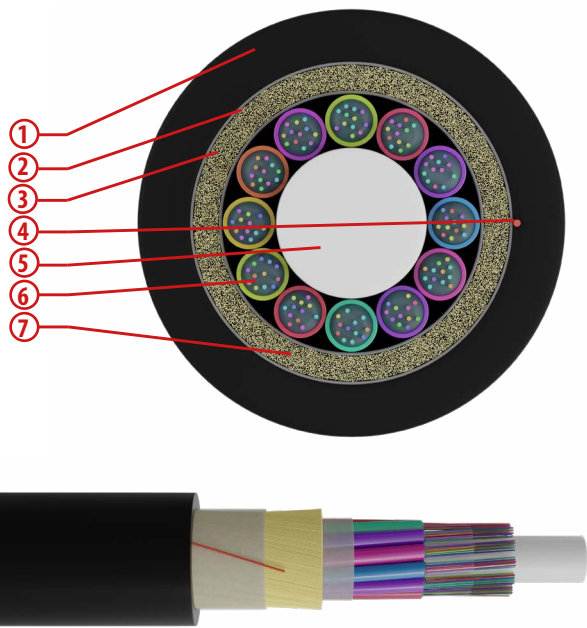
Tratos provides ADSS cable on several standard sizes of non-returnable wooden reels. Non-standard reel sizes are available on request.

TRATOS FIBRE OPTIC® SYSTEM

TRATOS ADSS FLEX-S®

Tratos Flex-S ADSS expands on Tratos's single jacket ADSS portfolio. Flex-S designs are optimised for a broader combination of fibre counts and span lengths, providing ADSS system designers more flexibility in their product selection. As its name indicates, there is no support or messenger wire required, so installation is achieved in a single pass. Flex-S ADSS includes fibre counts up to 144 optical fibres and any type or combination of single-mode or multi-mode fibres within the cable. Pole-to-pole span lengths range from 15 metres to over 300 metres.

FEATURES AND PERFORMANCES



CONSTRUCTION

- 1) Polyethylene outer jacket
- 2) Tape
- 3) Torque balanced aramid yarns
- 4) Ripcord
- 5) FRP central member
- 6) Gel-filled loose buffer tube (2-24 optical fibres / tube)
- 7) Water-blocking system

TECHNICAL SPECIFICATIONS

- Suitable for use on distribution lines
- Gel-filled buffer tubes are S-Z stranded for easy mid-span access
- Cable is water-blocked using dry core technology, therefore no messy flooding compounds
- Design details listed below for span lengths up to 457m and fibre counts up to 144
- Requires the use of formed wire dead ends

TYPICAL MAXIMUM LENGTHS

CABLE DIAMETER	REEL CAPACITY (METRES)
21.6 mm	7,000

Working Ambient Temperature:

Installation	- 30°C to + 50°C
In operation	- 40°C to + 85°C

OPTICAL INFORMATION

FIBRE TYPE	MAXIMUM ATTENUATION (dB/km)				OVERFILL LAUNCH MIN. BANDWIDTH (MHz-km)		GIGABIT ETHERNET MINIMUM LINK DISTANCE (metres)	
	850 nm	1300 nm	1310 nm	1550 nm	850 nm	1300 nm	850 nm	1300 nm
(6) 62.5/125 GIGA-Link™ 300	3.5	1.2	N/A	N/A	200	600	300	550
(8) 62.5/125 GIGA-Link™ 1000	3.5	1.2	N/A	N/A	350	600	500	1000
(5) 50/125 GIGA-Link™ 600	2.9	0.9	N/A	N/A	500	500	600	600
(7) 50/125 GIGA-Link™ 2000	2.9	0.9	N/A	N/A	500	800	750	2000
(L) 50 Laser-Link™ 300	2.9	0.9	N/A	N/A	1500	500	900	550
(9) Single-mode	N/A	N/A	0.35	0.25	N/A	N/A	N/A	5000
(Q) Non-zero Dispersion-shifted Single-mode	N/A	N/A	N/A	0.25	N/A	N/A	N/A	N/A
(K) SM Futureguide SR-15e Bend Insensitive	N/A	N/A	0.35	0.25	N/A	N/A	N/A	5000

Gigabit Ethernet Minimum Link Distances are based on "bandwidth"/modal dispersion constraints. Actual link distances may be constrained by attenuation, depending on specific loss budget.

TRATOS ADSS FLEX-S®

REEL INFORMATION

ITEM	REEL A CM	REEL B CM	REEL C CM	REEL D CM	REEL E CM
Reel Height	106.7	147.3	167.6	167.6	213.4
Reel Width Outside	91.4	96.5	106.7	106.7	101.6
Reel Width Inside	81.6	81.3	91.4	91.4	86.4
Drum Diameter	58.7	71.1	91.4	91.4	88.9
Arbor Hole Diameter	7.9	7.9	7.9	7.9	7.9
Reel Weight with Lagging	82 kg	191 kg	311 kg	311 kg	431 kg

Tratos provides ADSS cable on several standard sizes of non-returnable wooden reels. Non-standard reel sizes are available on request.

LIGHT

NESC LIGHT @ 1.5% INSTALLATION SAG							
SPAN METRES	TRATOS NO.	WEIGHT KG/KM	DIAMETER MM	MRCL N	INITIAL TENSION ¹		
					UNLOADED N	LOADED SAG % N	
12 FIBRES							
160	AE012*C520A08	84	10.8	2398	1104	0.8	2318
183	AE012*C520AA0	84	10.8	2661	1264	0.8	2634
213	AE012*C520AA5	84	10.8	3320	1482	0.8	3124
244	AE012*C520E08	88	11	3600	1758	0.8	3591
282	AE012*C520EA1	88	11	4445	2034	0.8	4214
320	AE012*C520EA2	88	11	4726	2309	0.8	4712
335	AE012*C520EA4	88	11	5291	2421	0.8	5015
24 FIBRES							
160	AE024*C520A08	86	10.8	2398	1121	0.8	2327
183	AE024*C520AA0	86	10.8	2661	1286	0.8	2643
213	AE024*C520AA5	86	10.8	3320	1504	0.8	3137
244	AE024*C520EA0	90	11	4165	1789	0.8	3729
282	AE024*C520EA1	90	11	4445	2065	0.8	4232
308	AE024*C520EA2	90	11	4726	2256	0.8	4592
335	AE024*C520EA4	90	11	5291	2461	0.8	5033
48 FIBRES							
160	AE048*C520A08	89	10.8	2398	1161	0.9	2350
183	AE048*C520AA1	89	10.8	2794	1326	0.9	2697
213	AE048*C520AA5	89	10.8	3320	1553	0.8	3164
244	AE048*C520EA0	93	11	4165	1842	0.8	3760
282	AE048*C520EA1	93	11	4445	2131	0.9	4263
314	AE048*C520EA2	93	11	4726	2376	0.9	4699
335	AE048*C520EA4	93	11	5291	2536	0.9	5073
72 FIBRES							
221	AE072*C620A08	112	11.8	3800	2020	0.9	3702
244	AE072*C620AA0	112	11.8	4063	2229	0.9	4054
267	AE072*C620AA3	112	11.8	4459	2438	0.9	4441
297	AE072*C620AA7	112	11.8	4984	2719	0.9	4953
328	AE072*C620EA0	112	11.8	5562	2999	0.9	5473
96 FIBRES							
282	AE096*C820A08	148	13.4	5767	3422	1	5651
305	AE096*C820AA1	149	13.4	6159	3702	1	6096
144 FIBRES							
221	AE144*O620A08	126	12.3	4061	2278	1.0	4031
259	AE144*O620AA4	128	12.4	4787	2709	1.0	4770
320	AE144*O620EA1	130	12.5	5954	3399	1.0	5948

¹ Initial tension indicates tension before 10 year creep.

Note: Diameter and weight subject to change without notice

* Fibre Types – Replace asterisk (*) in Tratos number with number corresponding to desired fibre type below.

- 5 = 50/125 µm multi-mode GIGA-Link™ 600
- 7 = 50/125 µm multi-mode GIGA-Link™ 2000
- 6 = 62.5/125 µm multi-mode GIGA-Link™ 300
- 8 = 62.5/125 µm multi-mode GIGA-Link™ 1000
- L = 50/125 µm multi-mode Laser-Link™ 300
- 9 = Single-mode
- K = SM Futureguide SR-15e Bend Insensitive
- Q = Non-zero dispersion-shifted single-mode

TRATOS FIBRE OPTIC® SYSTEM

TRATOS ADSS FLEX-S®

MEDIUM

NESC MEDIUM @ 1.5% INSTALLATION SAG							
SPAN METRES	TRATOS NO.	WEIGHT KG/KM	DIAMETER MM	MRCL N	INITIAL TENSION ¹		
					UNLOADED N	LOADED SAG % N	
12 FIBRES							
114	AE012*C520A08	84	10.8	2398	792	3.5	2367
122	AE012*C520AA0	84	10.8	2661	841	3.5	2550
152	AE012*C520AA5	84	10.8	3320	1059	3.5	3191
168	AE012*C520E08	88	11	3600	1210	3.5	3529
198	AE012*C520EA1	88	11	4445	1428	3.4	4223
213	AE012*C520EA2	88	11	4726	1540	3.5	4530
244	AE012*C520EA4	88	11	5291	1762	3.5	5148
24 FIBRES							
114	AE024*C520A08	86	10.8	2398	805	3.5	2372
122	AE024*C520AA0	86	10.8	2661	854	3.5	2559
152	AE024*C520AA5	86	10.8	3320	1077	3.5	3199
190	AE024*C520EA0	90	11	4165	1397	3.5	4040
198	AE024*C520EA1	90	11	4445	1451	3.4	4232
213	AE024*C520EA2	90	11	4726	1566	3.5	4543
244	AE024*C520EA4	90	11	5291	1789	3.5	5162
48 FIBRES							
114	AE048*C520A08	89	10.8	2398	832	3.5	2385
130	AE048*C520AA1	89	10.8	2794	939	3.5	2723
152	AE048*C520AA5	89	10.8	3320	1112	3.5	3217
190	AE048*C520EA0	93	11	4165	1442	3.5	4063
198	AE048*C520EA1	93	11	4445	1500	3.4	4258
213	AE048*C520EA2	93	11	4726	1615	3.5	4570
244	AE048*C520EA4	93	11	5291	1847	3.5	5193
72 FIBRES							
160	AE072*C620A08	112	11.8	3800	1460	3.4	3671
175	AE072*C620AA0	112	11.8	4063	1602	3.4	4000
190	AE072*C620AA3	112	11.8	4459	1740	3.4	4356
216	AE072*C620AA7	112	11.8	4984	1980	3.5	4930
244	AE072*C620EA0	112	11.8	5562	2229	3.5	5540
96 FIBRES							
221	AE096*C820A08	148	13.4	5767	2683	3.4	5705
236	AE096*C820AA1	149	13.4	6159	2870	3.4	6096
144 FIBRES							
160	AE144*O620A08	126	12.3	4061	1646	3.3	3947
190	AE144*O620AA4	128	12.4	4787	1993	3.3	4711
236	AE144*O620EA1	130	12.5	5954	2509	3.3	5878

¹ Initial tension indicates tension before 10 year creep.

Note: Diameter and weight subject to change without notice

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5 = 50/125 µm multi-mode GIGA-Link™ 600

7 = 50/125 µm multi-mode GIGA-Link™ 2000

6 = 62.5/125 µm multi-mode GIGA-Link™ 300

8 = 62.5/125 µm multi-mode GIGA-Link™ 1000

L = 50/125 µm multi-mode Laser-Link™ 300

9 = Single-mode

K = SM Futureguide SR-15e Bend Insensitive

Q = Non-zero dispersion-shifted single-mode

TRATOS ADSS FLEX-S®

HEAVY

NESC HEAVY @ 1.5% INSTALLATION SAG							
SPAN	TRATOS NO.	WEIGHT	DIAMETER	MRCL	INITIAL TENSION ¹		
					UNLOADED	LOADED	
METRES		KG/KM	MM	N	N	SAG %	N
12 FIBRES							
61	AE012*C520A08	84	10.8	2398	423	4.5	2158
76	AE012*C520AA0	84	10.8	2661	525	4.6	2603
91	AE012*C520AA5	84	10.8	3320	636	4.6	3159
99	AE012*C520E08	88	11	3600	712	4.6	3449
122	AE012*C520EA1	88	11	4445	881	4.6	4250
137	AE012*C520EA2	88	11	4726	988	4.7	4703
152	AE012*C520EA4	88	11	5291	1099	4.7	5237
24 FIBRES							
61	AE024*C520A08	86	10.8	2398	427	4.5	2158
76	AE024*C520AA0	86	10.8	2661	534	4.6	2608
91	AE024*C520AA5	86	10.8	3320	645	4.6	3168
114	AE024*C520EA0	90	11	4165	837	4.6	3991
122	AE024*C520EA1	90	11	4445	894	4.6	4258
137	AE024*C520EA2	90	11	4726	975	4.7	4690
152	AE024*C520EA4	90	11	5291	1117	4.7	5246
48 FIBRES							
61	AE048*C520A08	89	10.8	2398	441	4.5	2167
76	AE048*C520AA1	89	10.8	2794	552	4.6	2652
91	AE048*C520AA5	89	10.8	3320	667	4.6	3177
114	AE048*C520EA0	93	11	4165	863	4.6	4005
122	AE048*C520EA1	93	11	4445	921	4.6	4272
137	AE048*C520EA2	93	11	4726	1037	4.7	4726
152	AE048*C520EA4	93	11	5291	1153	4.7	5264
72 FIBRES							
91	AE072*C620A08	112	11.8	3800	837	4.4	3444
107	AE072*C620AA0	112	11.8	4063	975	4.6	3916
122	AE072*C620AA3	112	11.8	4459	1112	4.6	4428
137	AE072*C620AA7	112	11.8	4984	1255	4.6	4970
152	AE072*C620EA0	112	11.8	5562	1393	4.6	5531
96 FIBRES							
122	AE096*C820A08	148	13.4	5767	1482	4.3	5073
152	AE096*C820AA1	149	13.4	6159	1851	4.5	6070
144 FIBRES							
91	AE144*O620A08	126	12.3	4061	943	4.3	3675
122	AE144*O620AA4	128	12.4	4787	1277	4.4	4748
152	AE144*O620EA1	130	12.5	5954	1619	4.4	5944

¹ Initial tension indicates tension before 10 year creep.

Note: Diameter and weight subject to change without notice

* Fibre Types – Replace asterisk (*) in AFL number with number corresponding to desired fibre type below.

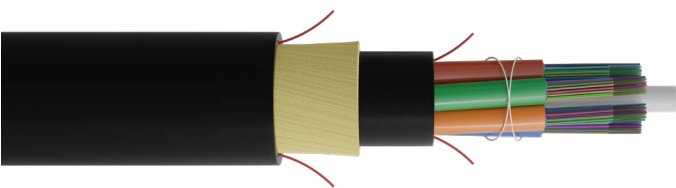
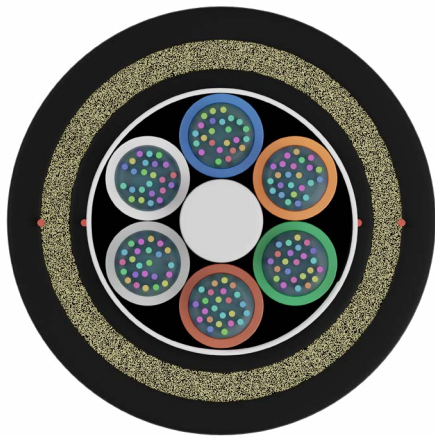
- 5 = 50/125 µm multi-mode GIGA-Link™ 600
- 7 = 50/125 µm multi-mode GIGA-Link™ 2000
- 6 = 62.5/125 µm multi-mode GIGA-Link™ 300
- 8 = 62.5/125 µm multi-mode GIGA-Link™ 1000
- L = 50/125 µm multi-mode Laser-Link™ 300
- 9 = Single-mode
- K = SM Futureguide SR-15e Bend Insensitive
- Q = Non-zero dispersion-shifted single-mode

TRATOS FIBRE OPTIC® SYSTEM

TRATOS ADSS LONG-S®

Tratos ADSS cables are specifically designed for use on overhead HV transmission and distribution lines with steel lattice towers or wooden, concrete or steel poles.




FEATURES AND PERFORMANCES



TECHNICAL SPECIFICATIONS




- Stranded loose tube design ensures that the fibres are always free from mechanical strain under the specified-loading conditions
- Double Jacket designs for medium to long span applications and moderate to heavy ice and wind loading conditions
- No metallic or conductive components, allowing the live-line installation (subject to local regulation)
- Torsionally-balanced aramid yarn strength elements provide stable cable design
- UV-resistant polyethylene sheath is compatible with fittings from all major suppliers and is suitable for use to 12kV space potential
- Custom designs for extremely long spans available
- Track-resistant options are also available for use up to 25kV space potential

AD SERIES

DESIGN	Fibre Count	Cross Section	OD	KG/KM	SPAN*	TEMP RANGE °C
AD-72DJA6/3.5	2-72		12	115	75	-40 - 85
AD-72DJA6/09	2-72		13	134	200	-40 - 85
AD-72DJA6/30	2-72		15	178	660	-40 - 85

* Based on 380Pa wind, 12.5mm radial ice, density 915 @ -5C, 1% initial sag

TRATOS ADSS LONG-S®

DESIGN	Fibre Count	Cross Section	OD	KG/KM	SPAN*	TEMP RANGE °C
AD-72DJB6/3.5	74-144		15	174	60	-40 - 85
AD-72DJB6/09	74-144		15	174	180	-40 - 85
AD-72DJB6/30	74-144		17	224	570	-40 - 85

* Based on 380Pa wind, 12.5mm radial ice, density 915 @ -5C, 1% initial sag
 Single-mode, multi-mode and non-zero dispersion-shifted fibre types are available on request

TRATOS UNDERGROUND CABLE

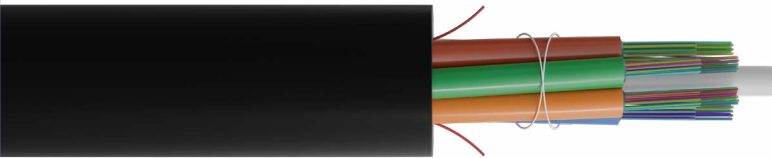
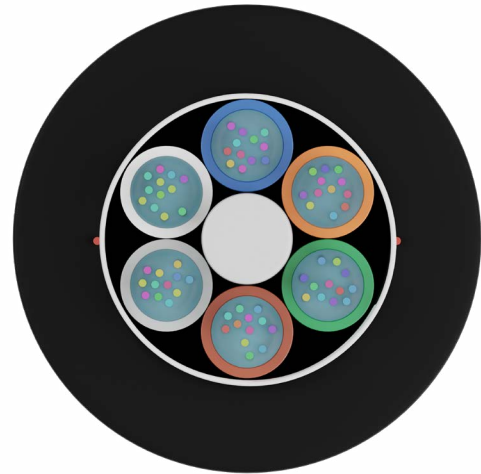
TRATOSDUCT®

Tratos Duct Cables and Flame Retardant Duct Cables are designed with cable strength suitable for pulling into ducts and sub ducts. These designs are also lightweight with a low friction jacket suitable for blowing installations.

FEATURES AND PERFORMANCES

TECHNICAL SPECIFICATIONS

- Fibre counts up to 288
- Fibre management of 6 to 12 tubes
- Dry water-blocking
- Metal-free therefore not subject to EMI or earth-bonding requirements
- Low friction outer sheath for easy handling and installation
- Lightweight and robust construction
- Suitable for blowing or pulling installations
- All Duct cables are tested to the Construction Products Regulation



DUCT CABLE

CPR rated to class F_{CA}

DESIGN	Fibre Count	Cross Section	OD (mm)	KG/KM	STRENGTH (kN)	TEMP RANGE °C
DU-72CA6/Bk	2-72		10.5	88	2.0	-25 - 65
DU-96CA8/Bk	74-96		12	113	2.0	-25 - 65
DU-144CA12/Bk	98-144		14	139	2.0	-25 - 65
DU-288CA12/Bk	146-288		17	222	2.0	-25 - 65

TRATOSFIBREOPTIC® SYSTEM

TRATOSDUCT®

GLASS REINFORCED DUCT CABLE

CPR rated to class F_{CA}

DESIGN	Fibre Count	Cross Section	OD (mm)	KG/KM	STRENGTH (kN)	TEMP RANGE °C
DU-72CG6/Bk	2-72		10.5	91	2.7	-25 - 65
DU-96CG8/Bk	74-96		12	123	2.7	-25 - 65
DU-144CG12/Bk	98-144		14	170	2.7	-25 - 65



LSZH DUCT CABLE

CPR rated to class E_{CA}

DESIGN	Fibre Count	Cross Section	OD (mm)	KG/KM	STRENGTH (kN)	TEMP RANGE °C
DU-72LSA6/Bk	2-72		10.5	118	2.0	-25 - 65
DU-96LSA8/Bk	74-96		12	157	2.0	-25 - 65
DU-144LSA12/Bk	98-144		14	176	2.0	-25 - 65

GLASS REINFORCED LSZH DUCT CABLE

CPR rated to class E_{CA}

DESIGN	Fibre Count	Cross Section	OD (mm)	KG/KM	STRENGTH (kN)	TEMP RANGE °C
DU-72LSG6/Bk	2-72		10.5	117	2.7	-25 - 65
DU-96LSG8/Bk	74-96		12	156	2.7	-25 - 65
DU-144LSG12/Bk	98-144		14	188	2.7	-25 - 65

TRATOSFIBREOPTIC® SYSTEM

TRATOMICROC®

MC® cables are designed for installation by blowing into underground micro-ducts to provide scalable broadband networks with very high implementation rates.

FEATURES AND PERFORMANCES

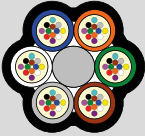



TECHNICAL SPECIFICATIONS

- Small diameter, lightweight and flexible
- High fibre counts to diameter ratio
- Low friction ribbed jacket to aid jetting process
- Easy-strip jacket for faster splicing and deployment
- Fibres arranged in colour coded buffer tubes
- Metal-free and therefore not subject to EMI or earth-bonding requirements
- MicroCore cables are compatible with micro-ducts supplied by all major manufacturers



250 MICRON RANGE

DESIGN	Fibre Count	Cross Section	OD (mm)	KG/KM	STRENGTH (kN)	TEMP RANGE °C
MC-72DA6-6.1	2-72		6.1	33	>600	-25 - 65
MC-96DA8-6.6	2-96		6.6	43	>600	-25 - 65
MC-144DA6-7.9	12-144		7.9	55	>800	-25 - 65
MC-144DA12-8.9	12-144		8.9	66	>600	-25 - 65

TRATOMICROC®

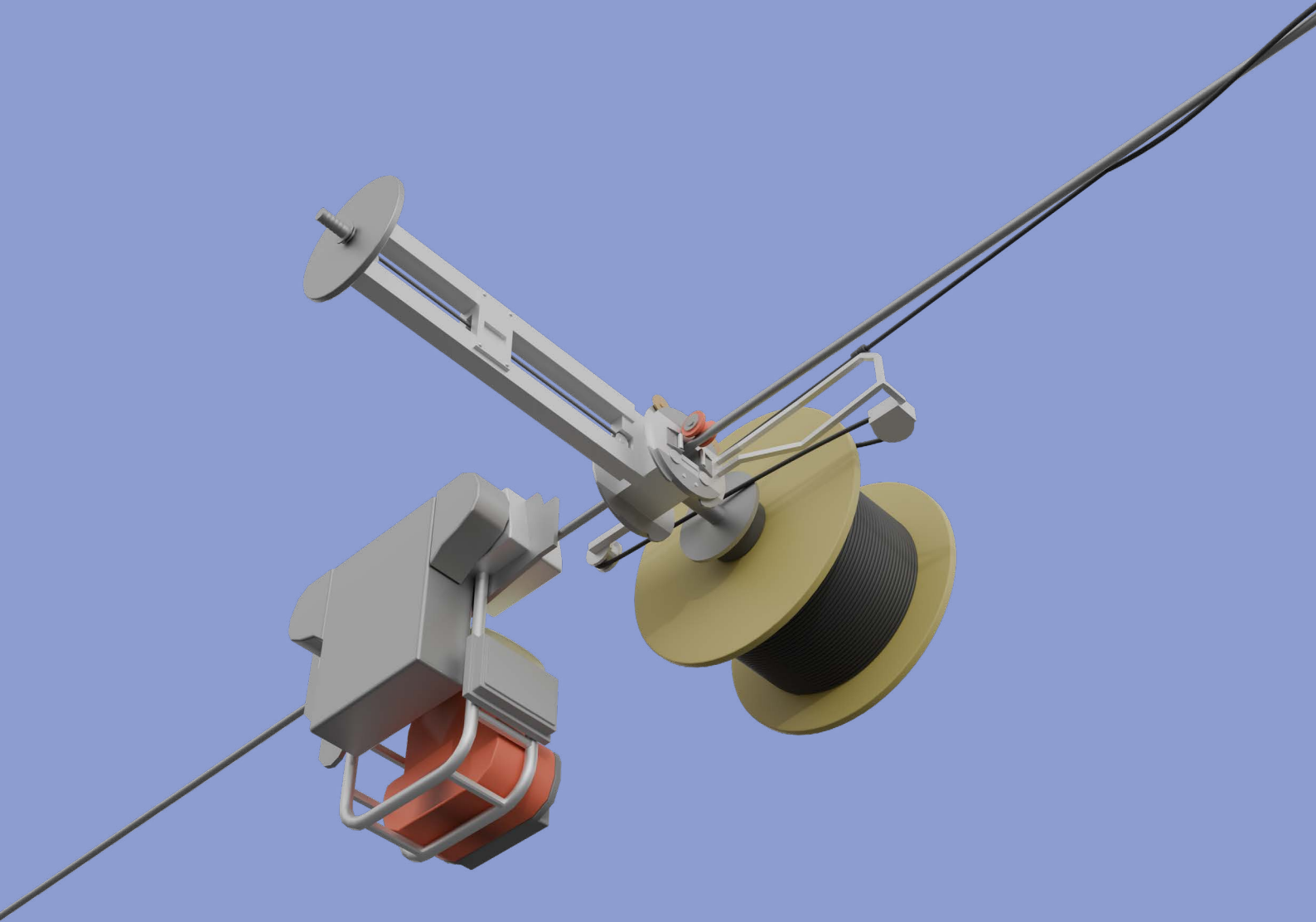
200 MICRON RANGE

DESIGN	Fibre Count	Cross Section	OD (mm)	KG/KM	STRENGTH (kN)	TEMP RANGE °C
MC200-72DA6	2-72		4.5	18	>600	-25 - 65
MC200-96DA8	2-96		5.2	25	>600	-25 - 65
MC200-144DA12	12-144		6.7	41	>600	-25 - 65

LM 200 MICRON RANGE

DESIGN	Fibre Count	Cross Section	OD (mm)	KG/KM	STRENGTH (kN)	TEMP RANGE °C
LM144BAO6101NS	2-144		6.3	34	200	-30 - 70
LM288BAR6101NS	2-288		8.1	56	300	-30 - 70

Single-mode, multi-mode and non-zero dispersion-shifted fibre types are available on request



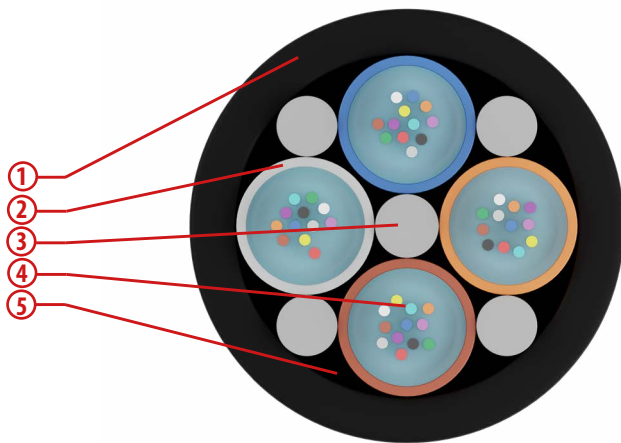
TRATOS WRAP SOLUTIONS

TRATOS SKYWRAP® - HIGH VOLTAGE

High Voltage SkyWrap is a specialised solution that permits the installation of SkyWrap onto phase conductors at system voltages of up to 300kV. The solution is applicable for power lines without ground wires with conductors running at system voltages between 150-300kV, opening up new transmission lines for power utilities to add fibre optic cable to their power network.

The system is developed, tested and approved to the applicable standards for working in this challenging environment, while maintaining all the key features and benefits of the SkyWrap system in terms of ease and speed of installation.

FEATURES AND PERFORMANCES



CONSTRUCTION

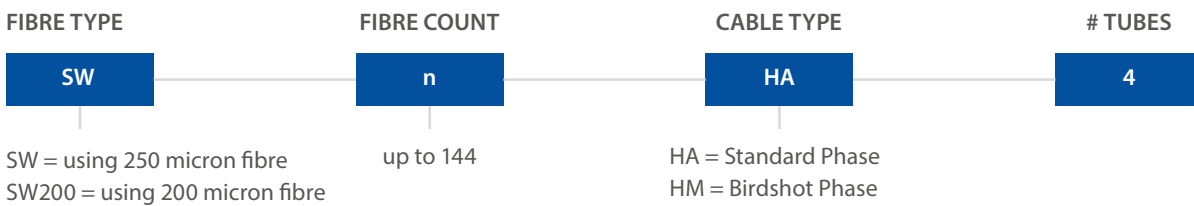
- 1) Outer Jacket
- 2) Buffer Tube
- 3) Strength Member
- 4) Fibre
- 5) Flooding Compound

TECHNICAL SPECIFICATIONS

- System developed exclusively for system voltages of 150kV to 300kV with no ground wire.
- Solution qualified to IEEE 1591.3 standard including Tracking & Erosion and Leakage Current.
- Solution tested against RIV and PD to CISPR 18-2.
- Pre-made Phase-To-Ground Insulator system ensures quick, simple and secure installation of critical components.
- Key features of SkyWrap cable retained, with dual layer anti-tracking sheath providing protection against shotgun damage, UV light, pollution, lightning and fault current conditions and electric field effects.
- Small size and low weight ensures minimum loads are applied to the overhead line

Working Ambient Temperature:	
Installation	- 10°C to + 50°C
In operation	- 40°C to + 85°C

PART NUMBER



STRIPE RING FIBRE IDENTIFICATION

ITEM NUMBER	FIBRE COUNT	CABLE O.D.	WEIGHT	LENGTH PER REEL	CASSETTE LENGTH
		mm	kg/km	m	m
STANDARD PHASE CONDUCTOR					
SW-nHA4	04 - 24	7.3	55	1,914	3,828
SW-nHA4	26 - 48	7.5	59	1,813	3,626
SW-nHA4	50 - 96	8.9	82	1,288	2,576
BIRDSHOT RESISTANT PHASE CONDUCTOR					
SW-nHM4	04 - 24	8.0	61	1,594	3,188
SW-nHM4	26 - 48	8.2	65	1,517	3,034
SW-nHM4	50 - 96	9.6	89	1,107	2,214
SW200-nHM4	100-144	9.4	81	1,154	2,308

Note: Diameter and weight subject to change without notice
Single-mode, multi-mode and non-zero dispersion-shifted fibre types are available on request

TRATOS FIBRE OPTIC® SYSTEM

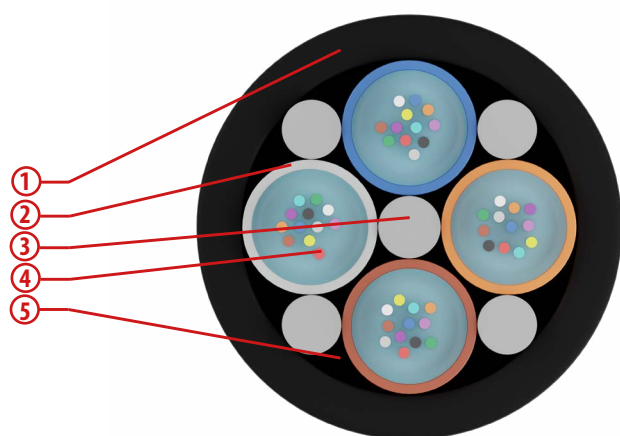
TRATOS SKYWRAP®

Successfully installed worldwide since 1982, SkyWrap is a fibre optic cable helically applied on ground wires or phase conductors. A specially designed spinning machine is used to wrap the cable under controlled conditions. This system offers a complete communication link designed and engineered for high-voltage environments at low cost.

SkyWrap is the ideal solution when access to the overhead line is problematic due to environment or terrain. The installation equipment is lightweight, easy to handle and quick to install. When power outages are hard to coordinate, SkyWrap can be installed on ground wire while the phase conductors remain live or on phase conductors with single circuit outage.

FEATURES AND PERFORMANCES

STANDARD DESIGN



CONSTRUCTION

STANDARD DESIGN

- 1) Outer Jacket
- 2) Buffer Tube
- 3) Strength Member
- 4) Fibre
- 5) Flooding Compound

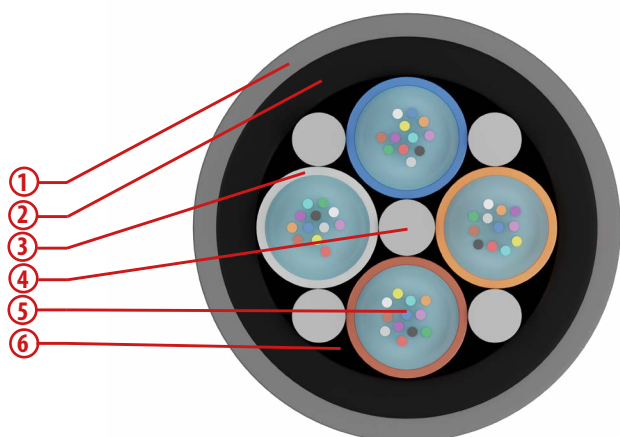
BIRDSHOT DESIGN

- 1) Outer Jacket
- 2) Inner Jacket
- 3) Buffer Tube
- 4) Strength Member
- 5) Fibre
- 6) Flooding Compound

TECHNICAL SPECIFICATIONS

- Suitable for use on distribution lines up to 150kV
- Gel-filled buffer tubes are S-Z stranded for easy mid-span access
- Dual layer jacket design (Birdshot) available for installation in areas prone to shotgun activity.
- Small size and low weight ensures minimum loads are applied to the overhead line
- Quick, cost effective installation
- Utilise existing power line infrastructure
- Use where access is limited (e.g. mountains and river crossings)
- Use for both ground wires and phase conductors
- Live line installations on ground wire or single circuit outage on phase
- Complete lifetime turn-key solutions
- Over 30 years installation experience

BIRDSHOT DESIGN

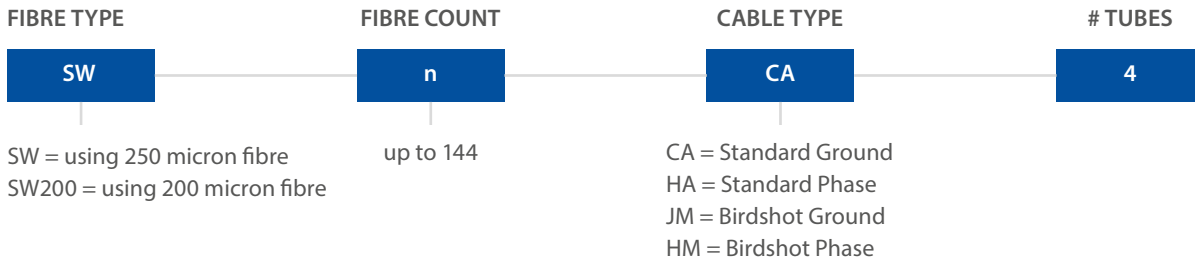


Working Ambient Temperature:

Installation	- 20°C to + 50°C
In operation	- 40°C to + 85°C

TRATOS SKYWRAP®

PART NUMBER



SKYWRAP ORDERING INFORMATION

ITEM NUMBER	FIBRE COUNT	CABLE O.D.	WEIGHT	LENGTH PER REEL	CASSETTE LENGTH
		mm	kg/km	m	m
STANDARD GROUND WIRE					
SW-nCA4	04 - 24	6.4	36	2,440	4,880
SW-nCA4	26 - 48	6.6	39	2,295	4,590
SW-nCA4	50 - 96	8.0	59	1,562	3,124
BIRDSHOT RESISTANT GROUND WIRE					
SW-nJM4	04 - 24	7.3	46	1,826	3,652
SW-nJM4	26 - 48	7.5	50	1,730	3,460
SW-nJM4	50 - 96	8.9	71	1,228	2,456
SW200-nJM4	100-144	8.7	55	1,285	2,570
STANDARD PHASE CONDUCTOR					
SW-nHA4	04 - 24	7.3	55	1,914	3,828
SW-nHA4	26 - 48	7.5	59	1,813	3,626
SW-nHA4	50 - 96	8.9	82	1,288	2,576
BIRDSHOT RESISTANT PHASE CONDUCTOR					
SW-nHM4	04 - 24	8.0	61	1,594	3,188
SW-nHM4	26 - 48	8.2	65	1,517	3,034
SW-nHM4	50 - 96	9.6	89	1,107	2,214
SW200-nHM4	100-144	9.4	81	1,154	2,308

Note: Diameter and weight subject to change without notice
Single-mode, multi-mode and non-zero dispersion-shifted fibre types are available on request

INSTALLATION EQUIPMENT INFORMATION

PARAMETER	VALUE
Typical Weight (includes cable and balance weight)	250kg
Min-Max Radius of rotation	0.87-1.45m
Wrapping Speed	5km per hour

INSTALLATION HARDWARE

A full range of hardware and accessories are available as part of the SkyWrap solution. Many different options are available to suit individual structure types and environmental conditions. Please contact Tratos for more information.

TRATOS FIBRE OPTIC® SYSTEM

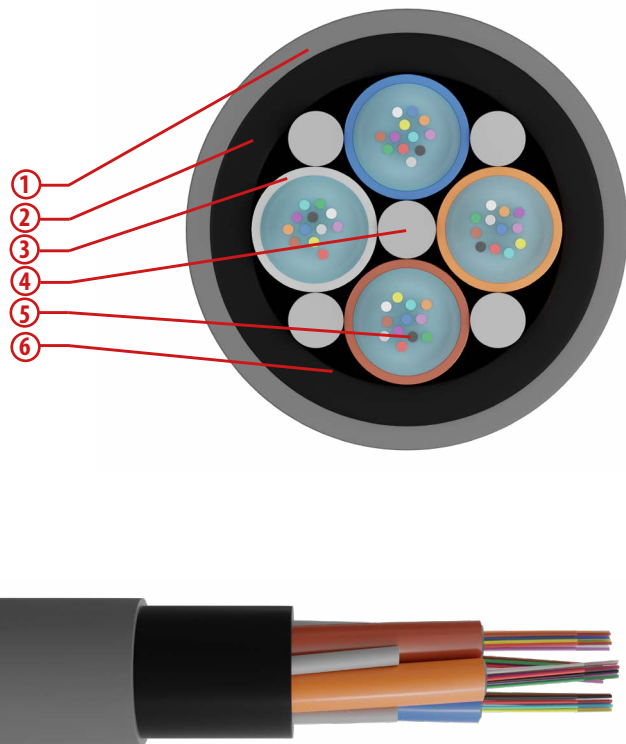
TRATOS ACCESSWRAP®

AccessWrap provides a quick, cost effective and sustainable solution for fibre deployment on the distribution section of power lines.

Based on proven SkyWrap® technology, cable is wrapped around the existing overhead power line infrastructure with minimal disruption to service and no modification requirements to structures. The cable can be wrapped on phase conductors up to 50kV and is designed to withstand the aggressive environments of aerial applications in any climate.

Tratos provides a complete solution to include line survey, cable, hardware and machine supply, project and installation management as well as warranty and maintenance services.

FEATURES AND PERFORMANCES



CONSTRUCTION

- 1) Outer Jacket
- 2) Inner Jacket
- 3) Buffer Tube
- 4) Strength Member
- 5) Fibre
- 6) Flooding Compound

TECHNICAL SPECIFICATIONS

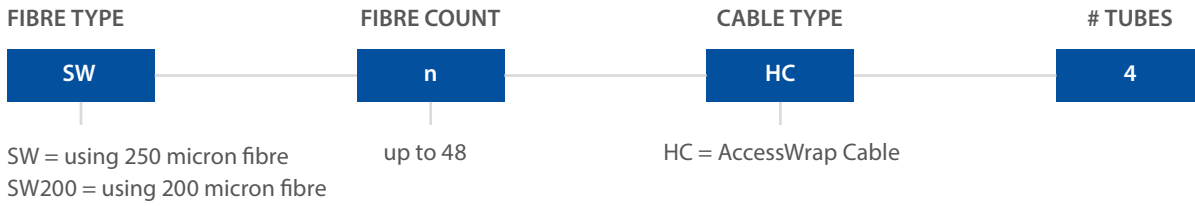
- Quick, cost effective installation
- Fibre counts up to 48, multiple fibre types available
- Zero fibre strain under all service conditions
- Minimal environmental impact
- Installation equipment weight and size is specially designed for installation on short span, compact conductors of up to 50kV
- Specially designed accessories supplied:-
 - Lightweight in-line splice case
 - Phase-To-Ground insulators
 - Compact pole mounted splice case
- Utilise existing power line infrastructure to minimise capital investment
- Minimise or eliminate deferred cost related to electrical infrastructure investment
- Alleviate problems of land access and areas of difficult terrain
- Extend fibre networks to remote LTE equipment in the roll out of mobile 5G
- Connectivity where terrain and line of sight issues make wireless less reliable
- Extend customer reach for FTTx applications particularly in rural and remote areas
- Integration as part of Smart Metering technology

Working Ambient Temperature:

Installation	- 10°C to + 50°C
In operation	- 40°C to + 85°C

TRATOS ACCESSWRAP®

PART NUMBER



ACCESSWRAP ORDERING INFORMATION

ITEM NUMBER	FIBRE COUNT	CABLE O.D.	WEIGHT	LENGTH PER REEL	CASSETTE LENGTH
		mm	kg/km	m	m
SW-nHC4	06 – 12	5.6	30	871	1,742
SW-nHC4	13 – 24	6.2	36	700	1,400
SW200-nHC4	25 – 48	6.2	36	700	1,400

Note: Diameter and weight subject to change without notice
 Single-mode, multi-mode and non-zero dispersion-shifted fibre types are available on request

INSTALLATION EQUIPMENT INFORMATION

PARAMETER	VALUE
Typical Weight (includes cable and balance weight)	45kg
Min-Max Radius of rotation	0.5m
Wrapping Speed	Up to 5km per hour

INSTALLATION HARDWARE

A full range of hardware and accessories are available as part of the AccessWrap solution. Many different options are available to suit individual structure types and environmental conditions. Please contact Tratos for more information.

Cables for a moving world





www.tratosgroup.com



<https://tratosgroup.com/contact-tratos/>