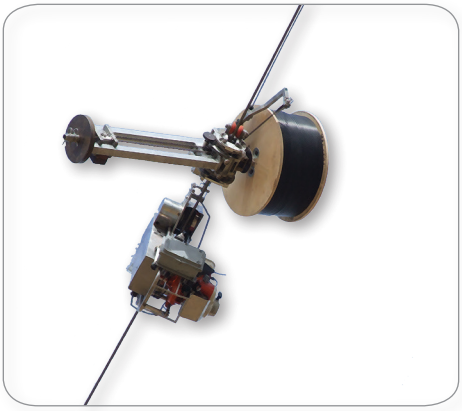


SkyWrap®

Successfully installed worldwide since 1982, SkyWrap is a fiber 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.

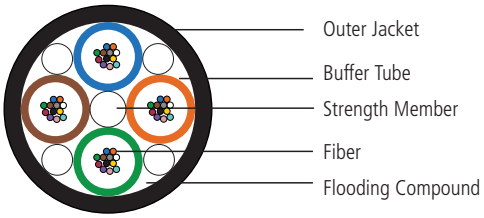
Features

- Suitable for use on distribution lines
- Gel-filled buffer tubes are S-Z stranded for easy mid-span access
- Design details listed below for span lengths up to 457 metres and fiber counts up to 144
- Requires the use of formed wire dead ends single circuit outage on phase
- Complete lifetime turn-key solutions
- Over 30 years installation experience

Benefits

- 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

Cable Components



Temperature Specifications

TEMPERATURE RANGE	
OPERATING	-40°C to +85°C
STORAGE	-40°C to +50°C
INSTALLATION	-20°C to +50°C

continued

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Specifications are subject to change without notice.

SkyWrap®

Part Number

FIBER TYPE		FIBER COUNT	CABLE TYPE	# TUBES
SW	—	n	x	4
SW = Standard Design SW200 = using 200 micron fibers		up to 144	CA = Standard Ground HA = Standard Phase JM = Birdshot Ground HM = Birdshot Phase	

SkyWrap Ordering Information

ITEM NUMBER	FIBER COUNT	CABLE O.D.	WEIGHT	LENGTH PER REEL	CASSETTE LENGTH
		mm	km/kg	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

Installation Equipment Information

PARAMETER	VALUE
Typical Weight (includes cable and balance weight)	250 kg
Min-Max Radius of Rotation	0.87 - 1.45 m
Wrapping Speed	5 km 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 AFL for more information.

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High Voltage SkyWrap®

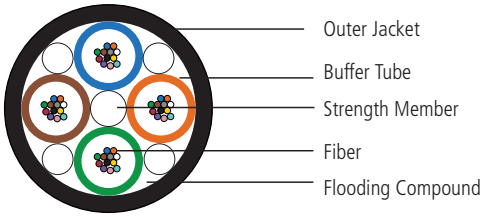
High Voltage SkyWrap is a specialized solution that permits the installation of SkyWrap onto phase conductors at system voltages of up to 300 kV. The solution is applicable for power lines without ground wires with conductors running at system voltages between 150-300 kV, opening up new transmission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

- System voltages of 150 kV to 300 kV with no ground wire
- Pre-made Phase-To-Ground Insulator system ensures quick, simple and secure installation of critical components
- 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
- System tested to standards for tracking and erosion, leakage current, partial discharge (PD) and radio-interferance voltage (RIV)

Cable Components



Part Number

FIBER TYPE		FIBER COUNT	CABLE TYPE	# TUBES
SW	—	n	x	4
SW = Standard Design SW200 = using 200 micron fibers		up to 144	HA = Standard Phase HM = Birdshot Phase	

continued

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High Voltage SkyWrap®

SkyWrap Ordering Information

ITEM NUMBER	FIBER COUNT	CABLE O.D.	WEIGHT	LENGTH PER REEL	CASSETTE LENGTH
		mm	km/kg	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 fiber types are available on request.

Qualifications

GOVERNING BODY	STANDARD CODE
IEEE	1591.3
CISPR	18-2

Temperature Specifications

TEMPERATURE RANGE	
OPERATING	-40°C to +85°C
STORAGE	-40°C to +50°C
INSTALLATION	-20°C to +50°C

Contact AFL for further details.

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Specifications are subject to change without notice.

SkyWrap® Ground Wire Hardware

A full range of hardware is available for fixing the SkyWrap cable to ground wire tower arrangements. The cable can be passed around tower tops using a specially designed bypass accessory known as a 'balehanger'. SkyWrap cable is passed down the tower to joint enclosures or termination joints in protective conduits. All cable clamps are supplied for fixing the SkyWrap cable as required.

Features

- All tower fittings are available for a range of tower or pole designs
- Tower mounted enclosure boxes are 830 x 380 x 260 mm
- All accessories are robust, weather-proof design
- Suitable for up to 144 fibers or 288 fibers with double SkyWrap applied
- Joint enclosure can be locked for added security

Typical Tower Arrangements

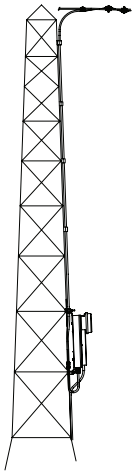


FIG. 1 – Termination Joint

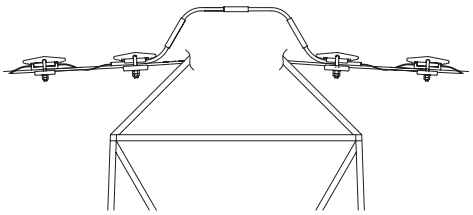


FIG. 2 – In-line Bypass

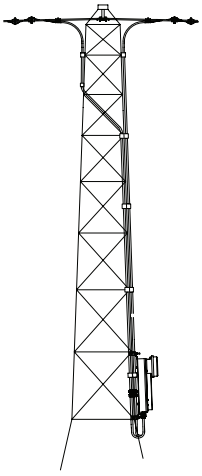


FIG. 3 – In-line Joint

Ordering Information

FIG. NO.	ARRANGEMENT		TOWER HEIGHT (Metres)			STRUCTURE TYPE			CONDUCTOR SIZE (mm)			DOUBLE WRAP	FIBER COUNT
			<25	<35	<60	LATTICE TOWER	STEEL/CONCRETE POLE	WOOD POLE	9-22	20-31	30-43		12-144
1	Termination Joint	TCD	L	M	H	902	906	962	A	B	C	D	nnF
2	In-line Bypass	TCD	–	–	–	909	909	909	A	B	C	D	–
3	In-line Joint	TCD	L	M	H	901	905	961	A	B	C	D	nnF

Example: TCD-L906BD48F or TCD-909A

Qualifications

GOVERNING BODY	STANDARD CODE	COMPONENT
IEEE	1591.3 1594	Fittings Cable
BS EN	50411-3	Tower Mounted Enclosure Boxes

Contact AFL for further details.

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SkyWrap® Phase Wire Hardware

A full range of hardware is available for fixing the SkyWrap cable to phase wire tower arrangements. The cable is passed around and kept away from conductor fittings using a specially designed bypass accessory known as 'balehanger'. SkyWrap cable is passed down the tower to joint enclosures or termination joints via a specially design system called Phase-to-Ground. This system provides electrical isolation and mechanical support to transition the SkyWrap cable from phase conductor to a tower mounted enclosure. Conductor mounted enclosures or 'donuts' are also available for SkyWrap cable, this enclosure is held at the same electric potential as the conductor keeping the joint protected by the Faraday Effect. Hardware fittings are available for tension and suspension tower designs using lattice towers, wood, steel or concrete poles.

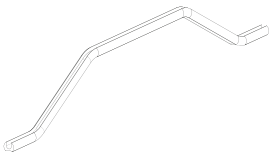
Features

- Robust weather-proof, track resistant designs to suit environmental and polluted conditions
- Available for up to 288 fibers
- Tower mounted enclosure boxes are 830 x 380 x 260 mm
- Suitable for up to 300 kV system voltage

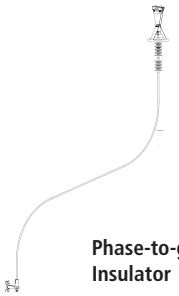
Key AccessWrap Components for System Voltages up to 50 kV



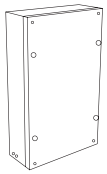
Conductor mounted Joint case



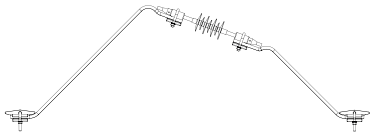
Balehanger



Phase-to-ground Insulator

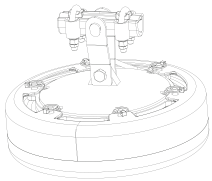


Tower mounted Joint enclosure

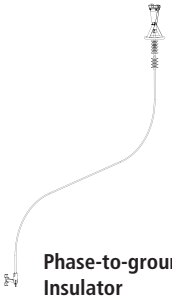


Section Pole Insulator

Key Components for System Voltages up to 150 kV



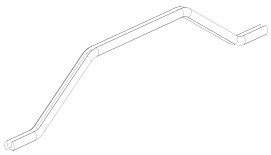
Conductor mounted Joint case



Phase-to-ground Insulator

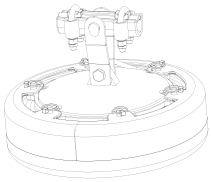


Tower mounted Joint enclosure

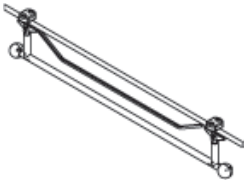


Aluminium balehanger

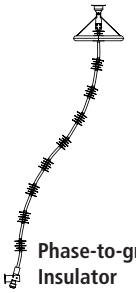
Key Components for System Voltages up to 300 kV



Conductor mounted Joint case



Balehanger



Phase-to-ground Insulator



Tower mounted Joint enclosure

continued

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SkyWrap® Phase Wire Hardware

Typical Tower Arrangements

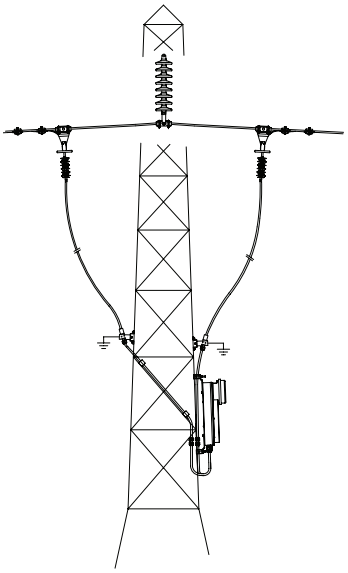


FIG. 1 – In-line Joint

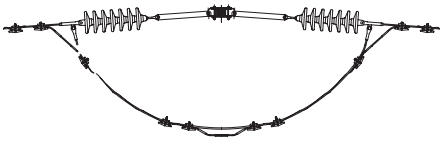


FIG. 2 – Tension Bypass

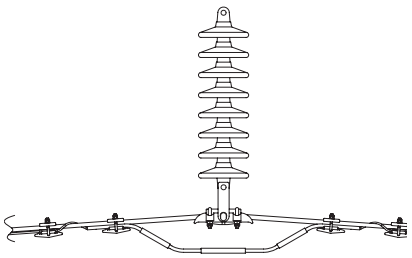


FIG. 3 – Suspension Bypass

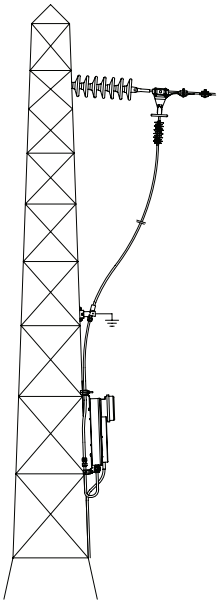


FIG. 4 – Termination Joint

Ordering Information

ARRANGEMENT			TOWER HEIGHT (Metres)			STRUCTURE TYPE					CONDUCTOR SIZE (mm)				DOUBLE WRAP	FIBER COUNT
FIG. NO. & TOWER TYPE	SYSTEM KV		<25	<35	<60	LATTICE TOWER	STEEL/ CONCRETE POLE	WOOD POLE	TENSION	SUSPENSION	9-22	20-31	30-43	42-60		12-144
1 In-line Joint	50	TCD	L	M	H	–	1016	1016	–	–	A	B	C	–	D	nnF
	150	TCD	L	M	H	912	916	920	–	–	A	B	C	–	D	nnF
	300	TCD	–	–	–	301	–	–	–	–		B	C	D	D	nnF
2 Tension Bypass	50	TCD	–	–	–	–	1010	1010	–	–	A	B	C	–	D	–
	150	TCD	–	–	–	927	927	927	–	–	A	B	C	–	D	–
	300	TCD	–	–	–	308	–	–	–	–		B	C	D	D	nnF
3 Suspension Bypass	50	TCD	–	–	–	–	1009	1009	–	–	A	B	C	–	D	–
	150	TCD	–	–	–	926	926	926	–	–	A	B	C	–	D	–
	300	TCD	–	–	–	303	–	–	–	–		B	C	D	D	nnF
4 Termination Joint	50	TCD	L	M	H	–	1017	1017	–	–	A	B	C	–	D	nnF
	150	TCD	L	M	H	913	917	921	–	–	A	B	C	–	D	nnF
	300	TCD	–	–	–	302	–	–	–	–		B	C	D	D	nnF
Conductor Mounted Joint	50	TCD	–	–	–	–	1025	1025	–	–	A	B	C	–	D	–
	150	TCD	L	M	H	–	–	–	924	925	A	B	C	–	D	nnF
	300	TCD	–	–	–	306	–	–	–	–		B	C	D	D	nnF

Example: TCD-L916BD48F or TCD-927A

Qualifications

GOVERNING BODY	STANDARD CODE	COMPONENT
IEEE	1591.3	Fittings
IEC	60, 1109 60060-1, 61109, 60437	Phase-to-Ground Donut
BS	5049 part 2-994	Donut

GOVERNING BODY	STANDARD CODE	COMPONENT
CISPR	18-2	Donut
BS EN	50411-3	Joint Enclosures

Contact AFL for further details.

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