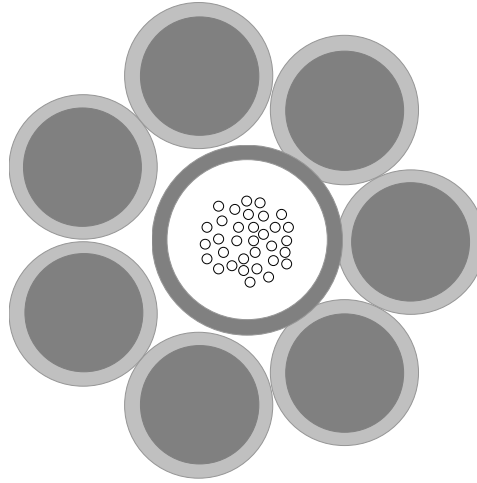


Specification DNO-9139

MiniCore Optical Ground Wire



MC-40/354

48 Corning® SMF-28e+™ Singlemode

Component Details						
	Component	#	OD		Area	
CENTER	Stainless Steel Tube	1	3.60 mm	0.1417 in	2.14 mm ²	0.0033 in ²
	LAYER 1 - LEFT HAND LAY					
	Aluminum Clad Steel (20.3% IACS)	7	2.70 mm	0.1063 in	40.08 mm ²	0.0621 in ²

Standards	
Designed and Manufactured in accordance with the following:	
Cable	IEEE 1138, IEC 60794-4
Fiber	IEC 60793, ITU-T G.65x Series
Color Code	ANSI/EIA 359-A, 598-A, IEC 60304
Stainless Steel Tubes	ASTM A240, ASTM A632
Aluminum Clad Steel Wires	ASTM B415

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Mechanical / Electrical Details		
Calculated Breaking Load	5,555 kg	12,247 lbs
Maximum Cable Design Tension	2,276 kg	5,019 lbs
Approximate Cable Diameter	9.00 mm	0.354 in
Total Cross-Sectional Area	42.22 mm ²	0.0654 in ²
Approximate Cable Weight	294 kg/km	1,042 lbs/mile
Modulus of Elasticity	16,043 kg/mm ²	22,817 kpsi
Coefficient of Linear Expansion	1.29E-05 1/°C	7.16E-06 1/°F
Sag10™ Chart Number	1-1449	1-1449
Calculated DC Resistance (20°C)	2.1274 Ohms/km	3.4238 Ohms/mile
Short Circuit Rating	9 (kA) ² •sec	9 (kA) ² •sec
Short Circuit Ambient Temperature	40 °C	104 °F
Short Circuit Duration 1 sec	3.0 kA	3.0 kA

Optical Details

Attenuation Characteristics for Corning® SMF-28e+™ Singlemode Fiber

Max Individual

0.35 dB/km 1310 nm

0.20 dB/km 1550 nm

3.6mm Stainless Steel Tube Design		Fiber Count
Unit	Fiber Type	
Tube 1	Corning® SMF-28e+™ Singlemode	48
Total Fiber Count		48

Standard Fiber Color Code

Fiber	1	2	3	4	5	6	7	8	9	10	11	12
Color	Blue	Orange	Green	Brown	Slate	White	Red	Black	Yellow	Violet	Rose	Aqua

Designs with more than 12 fibers per tube will use the standard color code and binders for identification of the fibers.

Installation and Handling Recommendations

Installation and cable preparation procedures are outlined in the AFL documents listed below. Contact AFL to request copies.

Recommended Installation Procedures for Composite Optical Ground Wire

Installation Instructions for Installing Optical Ground Wire in an AFL Telecommunications Splice Enclosure

Fiber Optic Cable Receiving, Handling and Storage. Document ACS-WI-809

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Quick Reference Installation Notes		
Approximate Cable Diameter	9.00 mm	0.354 in
Maximum Stringing Tension (at tensioner)*	1,111 kg	2,449 lbs
Minimum Bull Wheel Diameter	63 cm	25 in
Stringing Sheave Diameter**	36 cm	15 in
Minimum Bending Radius		
Cable		
Static (No load)	14 cm	6 in
Dynamic (under tension)	18 cm	7 in
Fiber		
Static (No load)	3.8 cm	1.5 in
Stainless Steel Tube		
Static (No load)	16.2 cm	6.4 in
<p>* - The stringing tension is always measured at the tensioner side. In general the maximum stringing tension should be approximately half of the maximum sagging tension and should never exceed 20% RBS of the OPT-GW.</p> <p>** - The value indicated is for the first and last structures of the pull and is based on 40 times the diameter of the OPT-GW. Smaller diameters can be used at tangent structures. Reference AFL's installation instructions for more details.</p>		
<p>Reference AFL's "Recommended Installation Procedures for Composite Optical Ground Wire" for detailed installation instructions.</p>		

Shipping Reels												
Reel Type	FL	TR	DR	OW	Tare (kgs)	FL	TR	DR	OW	Tare (lbs)	Capacity (meters) (feet)	
	(cm)					(in)						
Wood	152	91	91	107	245	60	36	36	42	540	7,000	22,960
Wood	168	91	91	107	260	66	36	36	42	573	7,000	22,960
Wood	183	91	91	107	300	72	36	36	42	662	7,000	22,960
Wood	213	86	89	104	385	84	34	35	41	849	7,000	22,960
Steel	152	81	81	97	156	60	32	32	38	344	7,000	22,960
Steel	183	91	102	107	264	72	36	40	42	582	7,000	22,960
Steel	213	114	107	130	372	84	45	42	51	820	7,000	22,960
<p>FL - Flange Diameter; TR - Inside Traverse Width; DR - Drum Diameter; OW - Outside Overall Width Arbor Hole Diameter: Wood: 3-1/4in (7.9cm) Steel: 3in (7.6cm)</p> <p>Maximum lengths shown are the longest lengths that AFL offers. Longer lengths may be possible.</p> <p>Ordered lengths should include a distribution of lengths, i.e., all reels cannot be ordered at the maximum. A typical reel length distribution is as follows:</p> <p style="padding-left: 20px;">6000m – 7000m ~ 15% of reels 4500m – 6000m ~ 55% of reels 2500m – 4500m ~ 25% of reels <2500m ~ 5% of reels</p> <p>Wood reels with flex-wrap covering are standard. Non-returnable steel reels and/or wood lagging are available upon request. Additional reel sizes may be available upon request.</p> <p>Steel reels are recommended for long term storage. Reference AFL's "Fiber Optic Cable Receiving, Handling and Storage" document for additional information.</p>												

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Electrical Characteristics					
Composite DC Resistance	[20°C]	2.1274 Ohms/km	3.4238 Ohms/mile		
Geometric Mean Radius		0.35 cm	0.0115 feet		
Inductive Reactance	[60 Hz frequency]	0.3367 Ohms/km	0.5419 Ohms/mile		
	[one foot (0.3048 meter) spacing]				
	[50 Hz frequency]	0.2806 Ohms/km	0.4516 Ohms/mile		
Capacitive Reactance	[60 Hz frequency]	0.2012 MOhms·km	0.1250 MOhms·mile		
	[one foot (0.3048 meter) spacing]				
	[50 Hz frequency]	0.2415 MOhms·km	0.1501 MOhms·mile		
Composite Coefficient of Thermal Resistance		0.00360 (1/°C)			
Temperature		DC Resistance		AC Resistance	
(°C)	(°F)	(Ohms/km)	(Ohms/mile)	(Ohms/km)	(Ohms/mile)
20	68	2.1274	3.4238	2.1700	3.4922
25	77	2.1657	3.4854	2.2090	3.5551
30	86	2.2040	3.5470	2.2481	3.6180
35	95	2.2423	3.6086	2.2872	3.6808
40	104	2.2806	3.6703	2.3262	3.7437
45	113	2.3189	3.7319	2.3653	3.8065
50	122	2.3572	3.7935	2.4043	3.8694
55	131	2.3955	3.8552	2.4434	3.9323
60	140	2.4338	3.9168	2.4825	3.9951
65	149	2.4721	3.9784	2.5215	4.0580
70	158	2.5104	4.0400	2.5606	4.1208
75	167	2.5487	4.1017	2.5996	4.1837
80	176	2.5870	4.1633	2.6387	4.2466
85	185	2.6252	4.2249	2.6778	4.3094
90	194	2.6635	4.2865	2.7168	4.3723
95	203	2.7018	4.3482	2.7559	4.4351
100	212	2.7401	4.4098	2.7949	4.4980
105	221	2.7784	4.4714	2.8340	4.5609
110	230	2.8167	4.5331	2.8731	4.6237
115	239	2.8550	4.5947	2.9121	4.6866
120	248	2.8933	4.6563	2.9512	4.7494
125	257	2.9316	4.7179	2.9902	4.8123
130	266	2.9699	4.7796	3.0293	4.8752
135	275	3.0082	4.8412	3.0683	4.9380
140	284	3.0465	4.9028	3.1074	5.0009
145	293	3.0848	4.9644	3.1465	5.0637
150	302	3.1231	5.0261	3.1855	5.1266

Specification DNO-9139

PLS-CADD Inputs

Use simplified elastic cable model (no creep, no coefficient)

Name				
Description		AFL OPGW DNO-9139 MC-40/354		
Cross section area (in ²)	<input type="text" value="0.0654"/>	Unit weight (lbs/ft)	<input type="text" value="0.197"/>	Number of independent wires <input type="text" value="1"/> <small>(above should be 1 unless cables are separated by spacers)</small>
Outside diameter (in)	<input type="text" value="0.354"/>	Ultimate tension (lbs)	<input type="text" value="12,247"/>	
Temperature at which strand data below obtained (deg F)	<input type="text" value="70"/>			

Outer Strands					Core Strands (if different from outer strands)						
Final Modulus of elasticity (psi/100)		<input type="text" value="199500"/>			Final Modulus of elasticity (psi/100)		<input type="text"/>				
Thermal expansion coeff. (/100 deg F)		<input type="text" value="0.000750"/>			Thermal expansion coeff. (/100 deg F)		<input type="text"/>				
Polynomial coefficients (all strains in %)					Polynomial coefficients (all strains in %)						
	A0	A1	A2	A3	A4		A0	A1	A2	A3	A4
Stress-strain	<input type="text" value="-3419"/>	<input type="text" value="217338.7"/>	<input type="text" value="-125735.9"/>	<input type="text" value="100730"/>	<input type="text" value="-51208"/>	Stress-strain	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Creep	<input type="text" value="-569.3"/>	<input type="text" value="126887.7"/>	<input type="text" value="90662.1"/>	<input type="text" value="-175495"/>	<input type="text" value="79299"/>	Creep	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Thermal Rating Properties				
Resistance at two different temperatures				
Resistance (Ohms/mile)	<input type="text" value="3.4854"/>	at (deg F)	<input type="text" value="77"/>	Emissivity coefficient <input type="text" value="0.5"/>
Resistance (Ohms/mile)	<input type="text" value="4.1017"/>	at (deg F)	<input type="text" value="167"/>	Solar absorption coefficient <input type="text" value="0.5"/>
				* Outer strands heat capacity (Watt-s/ft-deg F) <input type="text"/>
				* Core heat capacity (Watt-s/ft-deg F) <input type="text"/>

<input type="button" value="Generate Coefficients from points on stress-strain"/>	<input type="button" value="OK"/>	<input type="button" value="Cancel"/>
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* These two fields do not need to be entered for OPGW - intentionally left blank.