

Alcoa Fujikura Ltd.

Telecommunications Division

OPTICAL GROUND WIRE OVERVIEW





Alcoa Fujikura Ltd. (AFL) has the world's largest aerial fiber optic manufacturing capacity, with all facilities ISO 9001 certified. As the leading supplier of composite overhead Optical Ground Wire (OPT-GW), AFL supplies the world's largest base of OPT-GW. AFL provides its customers with full turnkey project support, and is the perfect solution for your fiber optic cable needs.

AFL was the first to introduce High Fiber Count (HFC) OPT-GW and continues to lead the world with fiber counts as high as 288 fibers. Its high quality standards for design, testing and manufacturing utilize the highest-grade materials available to ensure maximum reliability and performance. By partnering with power utilities and carriers, AFL's engineers have developed unique high fiber count designs while maintaining small diameters. AFL OPT-GW is designed with a broad selection of conductivity, short circuit rating, strength, and weight ratings to meet even the strictest applications requirements. Incorporating the latest high bandwidth fiber optic technology, AFL OPT-GW is ideal for voice, data, and video communications.

As the only OPT-GW manufacturer that produces its own accessory hardware, AFL is able to provide you with a total system solution with its complete turnkey packages. AFL engineers will help you determine the perfect OPT-GW cable to fit your needs. Then, AFL will design, manufacture, and install the cable and hardware for your system, enabling receipt of quality products from one supply source. OPT-GW, placed at the highest point on power utility structures, offers a secure right-of-way and an extraordinary level of reliability. Its optical performance has proven to be superior and trouble-free throughout its long life.

AFL has designed OPT-GW for continuous use in the toughest environmental and electrical conditions such as the sub-zero temperatures of Siberia and the sweltering heat of Brazil. AFL can also custom design cables to fit your needs.



HIGH FIBER COUNT (HFC) OPT-GW DESIGN

DESIGN FEATURES

- High fiber count package with reduced diameter and weight (49 to 288 fibers)
- Laser-welded high grade stainless steel tube provides mechanical and thermal protection and hermetic seal for fibers
- Fiber excess length controlled to provide high load and long span capability
- Each optical fiber and tube is uniquely identified for organization at splice locations
- Stranded wires (type & size) selected to optimize mechanical and electrical properties
- Anti-rotational devices are not required for installation
- 40 year projected life

DESIGN CRITERIA

- Meets or exceeds test criteria specified in IEEE 1138 and other industry standards
- Test data available upon request

FIBER TYPE & ATTENUATION

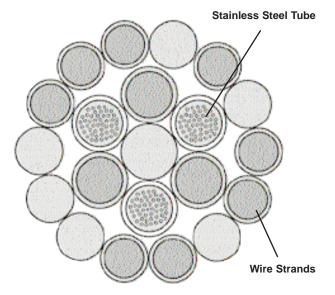
- Available fiber types include standard multimode, single-mode, dispersion shifted and non-zero dispersion shifted fibers
- Typical performance of 0.40/0.30 dB/km @ 1310/1550nm for single-mode fiber
- Tighter attenuation fibers available upon request

NOMENCLATURE

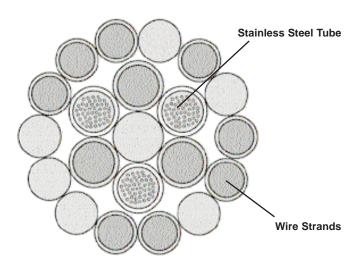


Note: Mechanical and electrical data, cross-sectional and hardware drawings, installation guides, and sag and tension information available upon request.

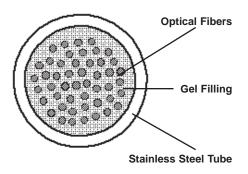
CABLE CROSS SECTION



UP TO 144 FIBER OPT-GW



OPTICAL UNIT CROSS SECTION



SPECIFICATIONS

			INPUT FOR SAG10™ PROGRAM									
Item Number	OPT-GW Size (Strand Area/O.D)	Fault Current	Total Cond	ductor Area	Overall I	Diameter	We	ight	RI	3S	Sag10™ Chart	
ramber	(Girana / irea/G.D)	(kA)2sec	in ²	mm²	in	mm	lbs/ft	kg/m	lbs	kg	Number	
HFC7205	S1-60/70/630	107	0.2090	134.87	0.630	16.0	0.4612	0.686	22,534	10,221	1-1444	
HFC7215	S1-69/69/646	121	0.2204	142.21	0.646	16.4	0.4723	0.703	22,857	10,368	1-420	
HFC7225	S1-75/76/669	145	0.2407	155.29	0.669	17.0	0.5144	0.766	25,109	11,389	1-420	
HFC9605	S1-60/70/630	107	0.2090	134.87	0.630	16.0	0.4612	0.686	22,534	10,221	1-1444	
HFC9615	S1-69/69/646	121	0.2204	142.21	0.646	16.4	0.4723	0.703	22,857	10,368	1-420	
HFC9625	S1-75/76/669	145	0.2407	155.29	0.669	17.0	0.5144	0.766	25,109	11,389	1-420	
HFC14405	S1-60/60/630	93	0.1966	126.83	0.630	16.0	0.4316	0.642	19,907	9,030	1-420	
HFC14415	S1-69/59/646	106	0.2080	134.17	0.646	16.4	0.4428	0.659	20,230	9,176	1-536	
HFC14425	S1-75/66/669	129	0.2282	147.25	0.669	17.0	0.4848	0.722	22,482	10,198	1-536	

Note: Custom designs available

TYPICAL REEL LENGTHS

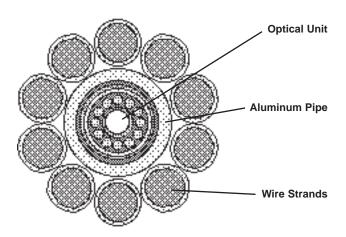
Item Number	NR68.	34.35*	NR72	34.35*	NR84.34.35*		
	feet	meters	feet	meters	feet	meters	
HFC7205	13,700	4,175	15,900	4,845	15,900	4,845	
HFC7215	13,000	3,960	15,300	4,660	15,900	4,845	
HFC7225	12,100	3,690	14,250	4,340	15,900	4,845	
HFC9605	13,700	4,175	15,900	4,845	15,900	4,845	
HFC9615	13,000	3,960	15,300	4,660	15,900	4,845	
HFC9625	12,100	3,690	14,250	4,340	15,900	4,845	
HFC14405	13,700	4,175	15,900	4,845	15,900	4,845	
HFC14415	13,000	3,960	15,300	4,660	15,900	4,845	
HFC14425	12,100	3,690	14,250	4,340	15,900	4,845	

Longer lengths available upon request.

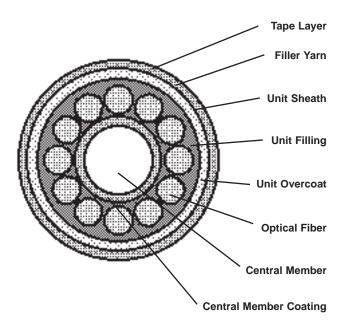
^{*}Reel nomenclatures and specifications are identified on page 11.



TRADITIONAL OPT-GW DESIGN



CABLE CROSS SECTION



OPTICAL UNIT CROSS SECTION

DESIGN FEATURES

- "Tight Structure" optical unit provides optimal mechanical and thermal fiber protection
- Thick wall aluminum pipe provides maximum protection of fiber units with hermetic seal, excellent crush resistance, and low resistivity
- Stranded wires (type & size) selected to optimize mechanical and electrical properties
- 40 year projected life

DESIGN CRITERIA

- Meets or exceeds test criteria specified in IEEE 1138 and other industry standards
- Test data available upon request

FIBER TYPE AND ATTENUATION

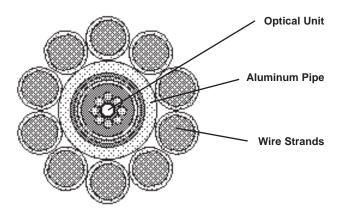
- Available fiber types include standard multimode, single-mode, dispersion shifted and non-zero dispersion shifted fibers
- Typical performance of 0.40/0.30 dB/km @ 1310/1550nm or single-mode fiber
- Tighter attenuation fibers available upon request

NOMENCLATURE



Note: Mechanical and electrical data, cross-sectional and hardware drawings, installation guides, and sag and tension information available upon request.

SINGLE OPTICAL UNIT CONSTRUCTION - UP TO 8 FIBERS



SPECIFICATIONS

			INPUT FOR SAGI0™ PROGRAM									
Item Number	OPT-GW size (Strand Area/O.D.)	Fault Current (kA)²sec	Total Conductor Area		Overall I	Diameter	Weight		RI	38	Sag10™ Chart Number	
		()	in²	mm²	in	mm	lbs/ft	kg/m	lbs	kg		
GW0800	53mm²/449	33	0.1166	75.24	0.449	11.4	0.2835	0.4228	0.4228	6,859	1-1453	
GW0805	16/37mm²/449	38	0.1166	75.24	0.449	11.4	0.2415	0.3594	11,856	5,378	1-536	
GW0810	27/27mm²/449	40	0.1166	75.24	0.449	11.4	0.2131	0.3171	9,679	4,390	1-1439	
GW0815	68mm²/448	46	0.1396	90.08	0.488	12.4	0.3512	0.5226	19,158	8,690	1-1423	
GW0820	23/45mm ² /488	54	0.1396	90.08	0.488	12.4	0.2905	0.4324	14,515	6,584	1-420	
GW0825	30/38mm ² /488	56	0.1396	90.08	0.488	12.4	0.2703	0.4023	12,967	5,882	1-917	
GW0830	86mm²/535	63	0.1677	108.17	0.535	13.6	0.4329	0.6442	22,279	10,106	1-1442	
GW0835	32/54mm ² /535	77	0.1677	108.17	0.535	13.6	0.3465	0.5157	16,249	7,371	1-536	
GW0840	43/43mm²/535	81	0.1677	108.17	0.535	13.6	0.3177	0.4728	14,239	6,459	1-1170	
GW0845	111mm²/598	92	0.2069	133.48	0.598	15.2	0.5472	0.8143	26,305	11,932	1-1429	
GW0850	32/80mm ² /598	110	0.2069	133.48	0.598	15.2	0.4621	0.6876	21,025	9,537	1-1461	
GW0855	48/64mm²/598	118	0.2069	133.48	0.598	15.2	0.4195	0.6243	18,385	8,339	1-1460	

Note: Customized designs available

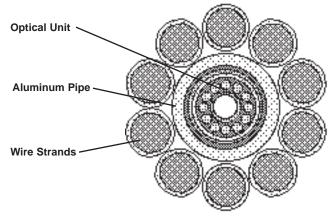
TYPICAL REEL LENGTHS

Item Number	NR60.	28.30*	NR68.3	4.35*	NR72.34.35*		
	feet	meters	feet	meters	feet	meters	
GW0800	21,378	6,516	23,000	7,010	23,000	7,010	
GW0805	21,378	6,516	23,000	7,010	23,000	7,010	
GW0810	21,378	6,516	23,000	7,010	23,000	7,010	
GW0815	18,069	5,507	23,000	7,010	23,000	7,010	
GW0820	18,069	5,507	23,000	7,010	23,000	7,010	
GW0825	18,069	5,507	23,000	7,010	23,000	7,010	
GW0830	15,021	4,578	23,000	7,010	23,000	7,010	
GW0835	15,021	4,578	23,000	7,010	23,000	7,010	
GW0840	15,021	4,578	23,000	7,010	23,000	7,010	
GW0845	12,025	3,665	18,649	5,684	19,607	5,976	
GW0850	12,025	3,665	18,649	5,684	19,607	5,976	
GW0855	12,025	3,665	18,649	5,684	19,607	5,976	

^{*}Reel nomenclatures and specifications are identified on page 11.



SINGLE OPTICAL UNIT CONSTRUCTION - UP TO 24 FIBERS



SPECIFICATIONS

*12 fiber unit shown

					II.	IPUT FOR	SAG10™ P	ROGRAM			
Item Number	OPT-GW Size (Strand Area/O.D.)	Fault Current (kA)² sec	Total Conductor Area		Overall Diameter		Weight		RBS		Sag10™ Chart Number
			in²	mm²	in	mm	lbs/ft	kg/m	lbs	kg	
GW1200	57mm²/465	35	0.1210	78.08	0.465	11.8	0.3036	0.4517	16,214	7,355	1-1421
GW1205	17/40mm²/465	40	0.1210	78.08	0.465	11.8	0.2576	0.3833	12,692	5,757	1-420
GW1210	23/34mm ² /465	42	0.1210	78.08	0.465	11.8	0.2422	0.3604	11,518	5,225	1-1440
GW1215	29/29mm²/465	43	0.1210	78.08	0.465	11.8	0.2269	0.3376	10,344	4,692	1-1439
GW1220	72mm²/504	48	0.1445	93.21	0.504	12.8	0.3718	0.5534	20,329	9,221	1-1442
GW1225	16/56mm ² /504	54	0.1445	93.21	0.504	12.8	0.3288	0.4893	17,031	7,725	1-1461
GW1230	24/48mm ² /504	57	0.1445	93.21	0.504	12.8	0.3072	0.4572	15,381	6,977	1-420
GW1235	32/40mm ² /504	59	0.1445	93.21	0.504	12.8	0.2858	0.4252	13,732	6,229	1-917
GW1240	91mm²/551	66	0.1729	111.56	0.551	14.0	0.4547	0.6767	23,421	10,624	1-1442
GW1245	23/68mm²/551	77	0.1729	111.56	0.551	14.0	0.3939	0.5863	19,181	8,701	1-1461
GW1250	34/57mm ² /551	81	0.1729	111.56	0.551	14.0	0.3636	0.5412	17,061	7,739	1-420
GW1255	45/45mm ² /551	86	0.1729	111.56	0.551	14.0	0.3333	0.4960	14,941	6,777	1-1170

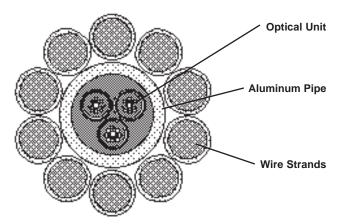
Note: Custom designs available

TYPICAL REEL LENGTHS

Item Number	NR60).28.30*	NR68	3.34.35*	NR72.34.35*		
	feet	meters	feet	meters	feet	meters	
GW1200	19,953	6,081	23,000	7,010	23,000	7,010	
GW1205	19,953	6,081	23,000	7,010	23,000	7,010	
GW1210	19,953	6,081	23,000	7,010	23,000	7,010	
GW1215	19,953	6,081	23,000	7,010	23,000	7,010	
GW1220	16,957	5,168	23,000	7,010	23,000	7,010	
GW1225	16,957	5,168	23,000	7,010	23,000	7,010	
GW1230	16,957	5,168	23,000	7,010	23,000	7,010	
GW1235	16,957	5,168	23,000	7,010	23,000	7,010	
GW1240	14,175	4,320	21,983	6,700	23,000	7,010	
GW1245	14,175	4,320	21,983	6,700	23,000	7,010	
GW1250	14,175	4,320	21,983	6,700	23,000	7,010	
GW1255	14,175	4,320	21,983	6,700	23,000	7,010	

^{*}Reel nomenclatures and specifications are identified on page 11.

MULTIPLE OPTICAL UNIT CONSTRUCTION - UP TO 24 FIBERS



SPECIFICATIONS

					II.	PUT FOR	SAG10™ F	ROGRAM			
Item Number	OPT-GW Size (Strand Area/O.D.) Fault Current (kA)² sec		Total Conductor Area		Overall Diameter		Weight		RBS		Sag10™ Chart Number
		(KA)- Sec	in²	mm²	in	mm	lbs/ft	kg/m	lbs	kg	Number
GW2400	64mm²/528	60	0.1531	98.80	0.528	13.4	0.3623	0.5391	18,433	8,361	1-1450
GW2405	25/39mm²/528	69	0.1531	98.80	0.528	13.4	0.2966	0.4413	13,400	6,078	1-1170
GW2410	29/34mm²/528	70	0.1531	98.80	0.528	13.4	0.2833	0.4218	12,393	5,621	1-1438
GW2415	74mm²/551	71	0.1688	108.88	0.551	14.0	0.4078	0.6068	21,174	9,605	1-1453
GW2420	25/49mm²/551	81	0.1688	108.88	0.551	14.0	0.3419	0.5087	16,123	7,313	1-1440
GW2425	37/37mm²/551	85	0.1688	108.88	0.551	14.0	0.3089	0.4597	13,598	6,168	1-1438
GW2430	83mm²/575	82	0.1829	118.01	0.575	14.6	0.4491	0.6682	23,659	10,732	1-1453
GW2435	30/53mm ² /575	95	0.1829	118.01	0.575	14.6	0.3682	0.5480	17,468	7,923	1-1440
GW2440	38/45mm²/575	98	0.1829	118.01	0.575	14.6	0.3479	0.5179	15,920	7,221	1-1455
GW2445	96mm²/606	99	0.2034	131.20	0.606	15.4	0.5085	0.7569	25,904	11,750	1-1421
GW2450	29/67mm²/606	114	0.2034	131.20	0.606	15.4	0.4313	0.6419	20,307	9,211	1-420
GW2455	48/48mm²/606	122	0.2034	131.20	0.606	15.4	0.3797	0.5652	16,576	7,519	1-1439

Note: Custom designs available

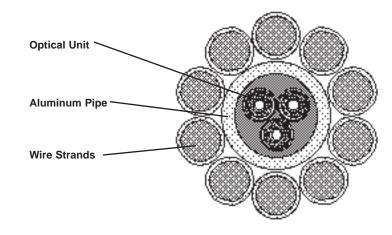
TYPICAL REEL LENGTHS

Item Number	NR60.	28.30*	NR68.	34.35*	NR72.34.35*		
	feet	meters	feet	meters	feet	meters	
GW2400	15,473	4,716	23,000	7,010	23,000	7,010	
GW2405	15,473	4,716	23,000	7,010	23,000	7,010	
GW2410	15,473	4,716	23,000	7,010	23,000	7,010	
GW2415	14,175	4,320	21,983	6,700	23,000	7,010	
GW2420	14,175	4,320	21,983	6,700	23,000	7,010	
GW2425	14,175	4,320	21,983	6,700	23,000	7,010	
GW2430	13,034	3,972	20,213	6,160	23,000	7,010	
GW2435	13,034	3,972	20,213	6,160	23,000	7,010	
GW2440	13,034	3,972	20,213	6,160	23,000	7,010	
GW2445	11,715	3,570	18,168	5,537	20,803	6,340	
GW2450	11,715	3,570	18,168	5,537	20,803	6,340	
GW2455	11,715	3,570	18,168	5,537	20,803	6,340	

^{*}Reel nomenclatures and specifications are identified on page 11.



MULTIPLE OPTICAL UNIT CONSTRUCTION - UP TO 36 FIBERS



SPECIFICATIONS

			INPUT FOR SAG10™ PROGRAM									
Item Number	OPT-GW Size (Strand Area/O.D.)	Fault Current (kA) ² sec	Total Cond	luctor Area	Overall I	Diameter	We	ight	RI	38	Sag10™ Chart Number	
		(KA) 360	in²	mm²	in	mm	lb/ft	kg/m	lbs	kg	INGILIDEI	
GW3600	65mm²/555	72	0.1646	106.18	0.555	14.1	0.3853	0.5733	18,960	8,600	1-1461	
GW3605	26/39mm ² /555	81	0.1646	106.18	0.555	14.1	0.3156	0.4697	13,624	6,180	1-1439	
GW3610	30/35mm ² /555	82	0.1646	106.18	0.555	14.1	0.3040	0.4524	12,734	5,776	1-1438	
GW3615	71mm²/571	79	0.1746	112.62	0.571	14.5	0.4144	0.6166	20,712	9,395	1-1450	
GW3620	20/51mm ² /571	87	0.1746	112.62	0.571	14.5	0.3597	0.5352	16,522	7,494	1-1440	
GW3625	36/36mm ² /571	93	0.1746	112.62	0.571	14.5	0.3187	0.4742	13,381	6,070	1-355	
GW3630	80mm²/591	90	0.1878	121.17	0.591	15.0	0.4530	0.6741	23,037	10,450	1-1457	
GW3635	31/49mm²/591	103	0.1878	121.17	0.591	15.0	0.3706	0.5514	16,724	7,586	1-1170	
GW3640	37/43mm ² /591	105	0.1878	121.17	0.591	15.0	0.3541	0.5269	15,461	7,013	1-1439	
GW3645	91mm²/614	104	0.2041	131.70	0.614	15.6	0.5005	0.7448	25,900	11,748	1-1453	
GW3650	30/60mm ² /614	118	0.2041	131.70	0.614	15.6	0.4197	0.6246	19,709	8,940	1-350	
GW3655	45/45mm²/614	125	0.2041	131.70	0.614	15.6	0.3793	0.5644	16,613	7,536	1-1438	

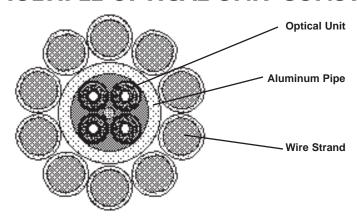
Note: Custom designs available

TYPICAL REEL LENGTHS

Item Number	NR60.	28.30*	NR68.	.34.35*	NR72.34.35*		
	feet	meters	feet	meters	feet	meters	
GW3600	13,976	4,260	21,673	6,606	23,000	7,010	
GW3605	13,976	4,260	21,673	6,606	23,000	7,010	
GW3610	13,976	4,260	21,673	6,606	23,000	7,010	
GW3615	13,215	4,028	20,492	6,246	23,000	7,010	
GW3620	13,215	4,028	20,492	6,246	23,000	7,010	
GW3625	13,215	4,028	20,492	6,246	23,000	7,010	
GW3630	12,349	3,764	19,150	5,837	22,572	6,880	
GW3635	12,349	3,764	19,150	5,837	22,572	6,880	
GW3640	12,349	3,764	19,150	5,837	22,572	6,880	
GW3645	11,417	3,480	17,703	5,396	20,869	6,361	
GW3650	11,417	3,480	17,703	5,396	20,869	6,361	
GW3655	11,417	3,480	17,703	5,396	20,869	6,361	

^{*}Reel nomenclatures and specifications are identified on page 11.

MULTIPLE OPTICAL UNIT CONSTRUCTION - UP TO 48 FIBERS



SPECIFICATIONS

			INPUT FOR SAG10™ PROGRAM										
Item Number	OPT-GW Size (Strand Area/O.D.)	Fault Current (kA) ² sec	Total Conductor Area		Overall I	Diameter	We	ight	RI	38	Sag10™ Chart Number		
		,	in²	mm²	in	mm	lbs/ft	kg/m	lbs	kg	1		
GW4800	86mm²/646	130	0.2208	142.43	0.646	16.4	0.5139	0.7647	25,098	11,384	1-1461		
GW4805	29/57mm²/646	144	0.2208	142.43	0.646	16.4	0.4372	0.6507	19,227	8,721	1-1170		
GW4810	34/52mm²/646	146	0.2208	142.43	0.646	16.4	0.4219	0.6279	18,053	8,189	1-1439		
GW4815	40/46mm²/646	148	0.2208	142.43	0.646	16.4	0.4066	0.6051	16,879	7,656	1-355		
GW4820	99mm²/669	151	0.2410	155.51	0.669	17.0	0.5729	0.8526	28,655	12,998	1-1450		
GW4825	21/78mm²/669	163	0.2410	155.51	0.669	17.0	0.5162	0.7682	24,307	11,026	1-536		
GW4830	28/71mm²/669	166	0.2410	155.51	0.669	17.0	0.4973	0.7400	22,857	10,368	1-1440		
GW4835	49/49mm²/669	176	0.2410	155.51	0.669	17.0	0.4405	0.6555	18,509	8,396	1-355		
GW4840	129mm²/724	204	0.2876	185.57	0.724	18.4	0.7088	1.0547	34,134	15,483	1-1453		
GW4845	32/97mm ² /724	227	0.2876	185.57	0.724	18.4	0.6224	0.9262	28,104	12,748	1-420		
GW4850	43/86mm²/724	234	0.2876	185.57	0.724	18.4	0.5936	0.8834	26,094	11,836	1-350		
GW4855	65/65mm ² /724	247	0.2876	185.57	0.724	18.4	0.5361	0.7977	22,074	10,013	1-1438		

Note: Custom designs available

TYPICAL REEL LENGTHS

Item Number	NR60	.28.30*	NR68.	34.35*	NR72.34.35*		
	feet	meters	feet	meters	feet	meters	
GW4800	10,330	3,148	16,020	4,882	18,882	5,755	
GW4805	10,330	3,148	16,020	4,882	18,882	5,755	
GW4810	10,330	3,148	16,020	4,882	18,882	5,755	
GW4815	10,330	3,148	16,020	4,882	18,882	5,755	
GW4820	9,613	2,930	14,909	4,544	17,572	5,355	
GW4825	9,613	2,930	14,909	4,544	17,572	5,355	
GW4830	9,613	2,930	14,909	4,544	17,572	5,355	
GW4835	9,613	2,930	14,909	4,544	17,572	5,355	
GW4840	8,206	2,501	12,726	3,878	15,000	4,572	
GW4845	8,206	2,501	12,726	3,878	15,000	4,572	
GW4850	8,206	2,501	12,726	3,878	15,000	4,572	
GW4855	8,206	2,501	12,726	3,878	15,000	4,572	

^{*}Reel nomenclatures and specifications are identified on page 11.



REEL INFORMATION

SHIPPING REEL DIMENSIONS

		NR60.28.30		NR68.34.35	NR72.34.35		
		inches	cm	inches	cm	inches	cm
	Flange Diameter (FL)	60	152	68	173	72	183
	Inside Traverse (TR)	28	71	34	86	34	86
	Drum Diameter (DR)	30	76	35	89	35	89
Reel Size (FL.TR.DR.)	Overall Width	35	89	41	104	41	104
(* =***********************************	Drive Pin Hole	1-1/2	3.8	1-1/2	3.8	1-1/2	3.8
	Location Radius	7	17.8	7	17.8	7	17.8
	Arbor Hole Diameter	3-1/8	7.9	3-1/8	7.9	3-1/8	7.9
Reel Tare		lbs	kg	lbs	kg	lbs	kg
Weight		320	145	560	245	615	280

NOTES:

- I. Prefix NR denotes non-returnable wood reel.
- 2. Reel dimensions and weight are nominal and subject to normal manufacturing tolerances.
- 3. Reels are constructed to withstand the rigors of normal shipping, handling, and stringing operations. (Reels are not designed to withstand the forces required for braking during tension.)
- 4. Reels will have steel bushings or flange plate reinforced arbor holes.
- 5. OPT-GW will be protected with one layer of composite polypropylene secured with banding.
- 6. Each reel will be tagged with shipping tags attached to the outside of each reel flange. All essential information such as identification, OPT-GW size, order number, length and gross/tare/net weight will appear legibly on the tag.
- 7. Non-returnable steel reels are available upon request.

REEL LENGTH DISTRIBUTION

Length	Range	Percent of Reels Shipped
3,280-6,559 ft	1-2 km	5%
6,560-9,839 ft	2-3 km	20%
9,840-16,400 ft	3-5 km	55%
16,401-19,686 ft	5-5.6 km	20%

HARDWARE SELECTION GUIDE

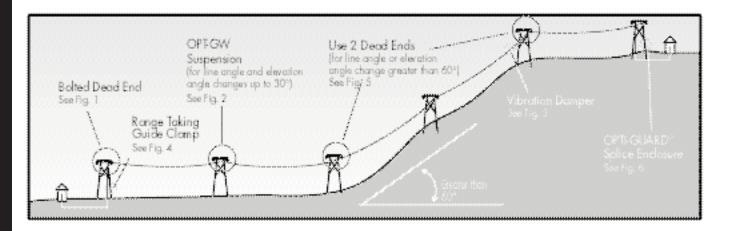






Figure 2 **Mechanical Suspension Assembly**

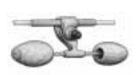


Figure 3 **Vibration Damper**



Figure 4 Range-Taking Guide Clamp



Figure 5 **Double Suspension Assembly**



Figure 6 **OPTI-GUARD™ Splice Enclosure**

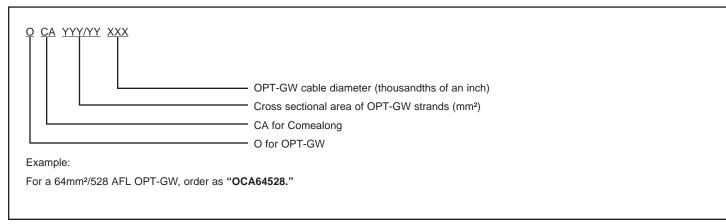


COMEALONG

The AFL Comealong is a temporary grip used during installation, "dead ending," and "clipping in" of the OPT-GW. The Comealong is also referred to as a "Pocketbook Grip" or "Butterfly Grip."

FEATURES & BENEFITS

- Custom designed for specific AFL OPT- GW
- Reusable
- 100% factory tested to ensure proper performance on specific OPT-GW
- Compact size
- Self-contained unit
- Easy installation and removal



BOLTED DEAD END

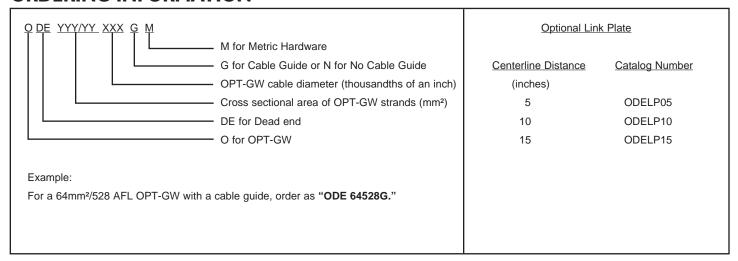




The AFL Dead End is a full tension termination for Optical Ground Wire cable. Breakaway head bolts are used to apply a precise gripping force to hold the cable without affecting optical fiber performance. The AFL Dead End is designed to maximize performance and minimize installation costs.

FEATURES & BENEFITS

- Performance: Sustained load equivalent to 95% of cable RBS
- Ultimate mechanical strength of dead end components: 40.000 lbs.
- Meets IEEE 1138 Vibration and Galloping tests
- Break-away bolts ensure proper installation torque while eliminating the need for specialized torque wrenches
- Optional Cable Guide (recommended) to train OPT-GW down or around the structure
- Drilled and tapped for grounding lug, thereby eliminating additional accessories for electrical bonding
- Shorter than formed wire dead ends, allowing installation from the support structure
- Faster installation than competitor designs, reducing installation costs
- Optional link plate for extension from structures



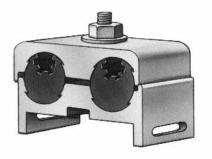


GUIDE CLAMPS

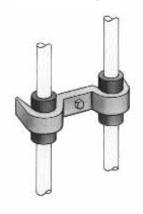
Clamps are used to guide the Optical Ground Wire from the top of the structure to the splice box. From poles to towers, AFL offers a full line of Optical Ground Wire Guide Clamps to meet the specific needs of any application.

FEATURES & BENEFITS

- Provides proper spacing and hold strength without damage to the cable
- Easy installation
- Corrosion resistant long life
- Slip strength: > 100 lbs.
- Lattice adapters provided with break-away bolts for precise torque during installation
- Steel tower guide clamps available with adapters to eliminate the need for drilling
- Banding adapters available



Downlead Clamp



Wood Pole Clamp

Item Number Bushing Color OPT-GW Diameter (inches) ODC400/500 RED 0.400 - 0.500 ODC501/600 GREEN 0.501 - 0.600 ODC601/700 YELLOW 0.601 - 0.700 ODC701/800 BLUE 0.701 - 0.800 ODC801/900 WHITE 0.801 - 0.900	DOWNLEAD CLAMP				
ODC501/600 GREEN 0.501 - 0.600 ODC601/700 YELLOW 0.601 - 0.700 ODC701/800 BLUE 0.701 - 0.800	Item Number	Bushing Color	OPT-GW Diameter (inches)		
ODC601/700 YELLOW 0.601 - 0.700 ODC701/800 BLUE 0.701 - 0.800	ODC400/500	RED	0.400 - 0.500		
ODC701/800 BLUE 0.701 - 0.800	ODC501/600	GREEN	0.501 - 0.600		
	ODC601/700	YELLOW	0.601 - 0.700		
ODC801/900 WHITE 0.801 - 0.900	ODC701/800	BLUE	0.701 - 0.800		
	ODC801/900	WHITE	0.801 - 0.900		
ODC901/1000 BLACK 0.901 - 1.000	ODC901/1000	BLACK	0.901 - 1.000		
**Note: For metric hardware, add suffix "M" to item number					
WOOD POLE CLAMP					
Item Number Bushing Color OPT-GW Diameter (inches)	Item Number	Bushing Color	OPT-GW Diameter (inches)		
OGW469/561 N/A 0.469 - 0.561	OGW469/561	N/A	0.469 - 0.561		
OGW562/655 N/A 0.562 - 0.655	OGW562/655	N/A	0.562 - 0.655		
OGW656/750 N/A 0.656 - 0.750	OGW656/750	N/A	0.656 - 0.750		
**Note: Not available with metric hardware					

Adapter for downlead clamp	CODE
Banding Adapter	Α
Lattice Adapter (up to 0.72" angle iron)	В
Lattice Adapter (up to 1.25" angle iron)	С

	Examples:
	For a 64mm ² /528 AFL OPT-GW with banding adapter, order as "ODC501/600A."
-[For a 64mm ² /528 on a wood pole, order as "OGW469/561."

Alcoa Fujikura Ltd.

Telecommunications Division

MECHANICAL SUSPENSION

The AFL Suspension supports spans of Optical Ground Wire cable through line angle changes up to 30 degrees. The unique design allows the compact unit to support loads and unbalanced cable loads without damaging the cable strands or affecting optical fiber performance. The AFL Suspension is designed to maximize performance and minimize installation costs.



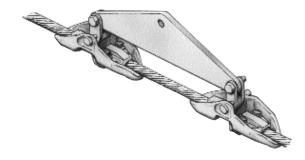
FEATURES & BENEFITS

- For changes in line angles up to 30°
- Slip strengths: > 3,000 lbs. (depending on cable design)
- Vertical load rating: 15,000 lbs.
- Meets IEEE 1138 Vibration and Galloping tests
- Compact design: only 34" in length
- Break-away bolts ensure proper installation torque while eliminating the need for specialized torque wrenches
- Lighter weight; easier installation
- Ideal for helicopter installation
- Unique keeper design allows installation without removing bolts (fewer loose parts)
- Drilled and tapped for grounding lug, eliminating additional accessories for electrical bonding
- Shorter than formed wire suspensions, allowing installation from the support structure
- Faster installation than competitor designs, reducing installation costs

ltem Number	OPT-GW Diameter (inches)	
SUME421/449	0.421 - 0.449	
SUME450/475	0.450 - 0.475	7
SUME476/499	0.476 - 0.499	EXAMPLE:
SUME500/527	0.500 - 0.527	For a 64mm²/528 AFL OPT-GW
SUME528/555	0.528 - 0.555	(cable diameter = 0.528"), order as SUME528/555.
SUME556/584	0.556 - 0.584]
SUME585/614	0.585 - 0.614	NOTE:
SUME615/646	0.615 - 0.646	NOTE: For metric hardware, add suffix "M" to
SUME647/679	0.647 - 0.679	item number.
SUME680/714	0.680 - 0.714	7
SUME715/730	0.715 - 0.730]



DOUBLE SUSPENSION ASSEMBLY



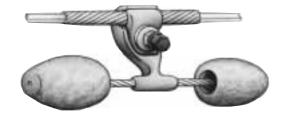
The AFL Double Suspension Assembly supports spans of Optical Ground Wire cable through line angle changes from 31 to 60 degrees. The unique design allows the compact unit to support loads and unbalanced cable loads without damaging the cable strands or affecting optical fiber performance. The AFL Double Suspension is designed to maximize performance and minimize installation costs.

FEATURES & BENEFITS

- For changes in line angles from 31° to 60°
- Slip strength: > 3,000 lbs. (depending on cable design)
- Vertical loading rating: 15,000 lbs.
- Meets IEEE 1138 Vibration and Galloping tests
- Compact design: only 48" in length
- Break-away bolts ensure proper installation torque while eliminating the need for specialized torque wrenches
- Lighter weight; easier installation
- Ideal for helicopter installation
- Unique keeper design allows installation without removing bolts (fewer loose parts)
- Drilled and tapped for grounding lug, eliminating additional accessories for electrical bonding
- Shorter than formed wire suspensions, allowing installation from the support structure
- Faster installation than competitor designs, reducing installation cost

ltem Number	OPT-GW Diameter (inches)	
ODSME421/449	0.421 - 0.449	
ODSME450/475	0.450 - 0.475	
ODSME476/499	0.476 - 0.499	EXAMPLE:
ODSME500/527	0.500 - 0.527	For a 64mm²/528 AFL OPT-GW
ODSME528/555	0.528 - 0.555	(cable diameter = 0.528"), order as ODSME528/555.
ODSME556/584	0.556 - 0.584	
ODSME585/614	0.585 - 0.614	NOTE:
ODSME615/646	0.615 - 0.646	For metric hardware, add suffix "M" to
ODSME647/679	0.647 - 0.679	item number.
ODSME680/714	0.680 - 0.714	7
ODSME715/730	0.715 - 0.730	7

VIBRATION DAMPER



The AFL Vibration Damper is used to provide control of the aeolian vibration induced by laminar winds across a conductor's surface. With over 70 years of experience in conductor motion control, the AFL Stockbridge-style damper provides excellent performance. Upon request, AFL can supply recommended placements based on actual line evaluations for optimum effect.

FEATURES & BENEFITS

- Unmatched experience in conductor motion control
- Excellent performance at a wide range of frequencies
- Break-away bolts for easy installation and proper torque
- All aluminum clamp ensures matching expansion/ contraction of conductor
- Line evaluations and recommendations (including usage and placement) available upon request

Item Number	OPT-GW Diameter (inches)	
OVD360/460	0.360 - 0.460	EXAMPLE:
OVD461/570	0.461 - 0.570	For a 64mm²/528 AFL OPT-GW (cable diameter= 0.528"), order as OVD461/570.
OVD571/675	0.571 - 0.675	
OVD676/770	0.676 - 0.770	Note:
OVD771/870	0.771 - 0.870	For metric hardware, add suffix "M" to item number.
OVD871/970	0.871 - 0.970	



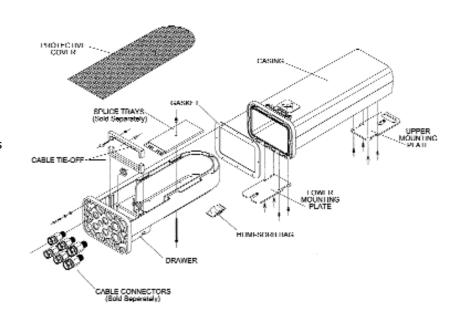
OPTI-GUARD™ SPLICE ENCLOSURE

The AFL OPTI-GUARD™ Splice Enclosure offers an innovative spectrum of features which makes it the best possible selection for your fiber optic splice protection needs. Its unique and flexible design (US and foreign patents pending), performed with the "real-world" splicer in mind, combines optimized system performance with unparalleled ease-of-use.

FEATURES & BENEFITS

- Accommodates up to 540 single fusion splices
- Accepts a wide selection of splice tray types
- Craft-friendly design requires no specialized tools to install and minimizes training requirements
- Messy sealers or tapes are not required for installation
- Easy to maintain and re-enter; no re-entry kit is required
- Light weight assembly can be mounted in any position to a variety of structures
- May be bolted or banded in place; special adapters are not required
- Specially designed non-metallic casing is impact, ultraviolet, temperature and chemical resistant
- Environmentally sealed to protect fibers from moisture and corrosion
- Advanced fiber unit routing system protects and controls fiber units
- Accepts up to six individual cables, each up to 1-1/4" nominal O.D.
- Accommodates most OPT-GW, ADSS, and LT cable types, in multiple environments
- Versatile internal cable tie-off system resists up to 100 lbs. of tension per cable





ORDERING INFORMATION

Order OPTI-GUARD™ as: OG03

NOTE: OPTI-GUARD™ is supplied without splice trays and cable connectors. These items must be ordered separately.

OPTI-GUARD™ SPLICE TRAY



The AFL OPTI-GUARD™ Splice Tray is specially designed for use with the AFL OPTI-GUARD™ Splice Enclosure (sold separately). The design of the tray (US and foreign patents pending) incorporates several innovative features which complement and enhance the OPTI-GUARD™ splicing system.

FEATURES & BENEFITS

- Cover features a multi-functional integrated bushing which:
 - ensures proper alignment of the cover with the tray
 - protects spliced fibers from being pinched or damaged
 - aligns each tray into its proper position within the drawers
 - accepts multiple splice trays into a self-aligning stack, thereby simplifying installation
- Peel & stick splice manifolds may be positioned according to individual preferences and procedures
- Special powder coating process for an attractive and durable black gloss finish with a smooth and resilient surface

ORDERING INFORMATION

Order OPTI-GUARD™ Splice Tray as: OGST01-24 (24 splices per tray capacity - standard)

OGST01-36 (36 splices per tray capacity recommended for special applications only)

Order Splice Protection Sleeves as: SPS-60 (60mm Fujikura #FP3 - standard)

SPS-40 (40mm Fujikura #FP3-40 recommended for special applications only)

NOTE: Sleeves are not included with Splice Tray. These items must be ordered separately.

Sleeves are supplied in packages of ten (10).

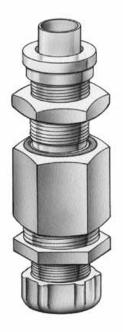


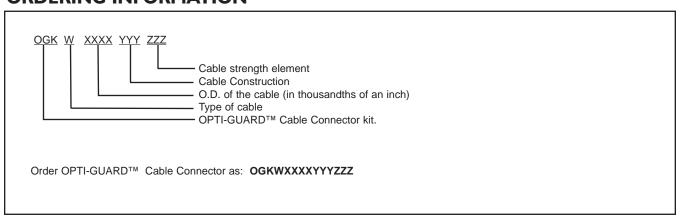
OPTI-GUARD™ CABLE CONNECTOR

The AFL OPTI-GUARD™ Cable Connector provides an easy and reliable method of terminating optical cables for splicing in the OPTI-GUARD™ Splice Enclosure (sold separately). Designed for maximum versatility, this connector may also be used with other AFL splice enclosures (such as the round, cast iron Model SB01), and is offered in configurations optimized for all fiber optic cable types in general use.

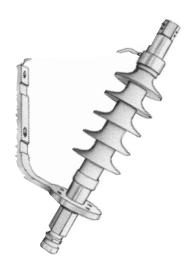
FEATURES & BENEFITS

- Provides a reliable, airtight cable-to-enclosure seal protecting the cable's optical fibers from environmental exposure
- Requires no specialized tools to install; minimal training to use
- Accommodates all OPT-GW types, including both AFL aluminum pipe OPT-GW and stainless steel tube HFC OPT-GW





26kV OPTICAL CABLE ISOLATOR



The AFL 26kV Optical Cable Isolator is designed for aerial optical cable system applications in which a complete electrical discontinuity is required. By providing reliable interruption of electrical current at voltages up to 26kV, the isolator is a critical component of optical conductor and neutral systems, as well as OPT-GW systems in which sectionalization of transient currents is required.

FEATURES & BENEFITS

- AFL Optical Cable Isolator is designed for use with AFL aluminum pipe optical cables
- Isolator requires very little training and only standard splicer tools to install
- Flexible and versatile design of the mounting bracket permits either 2-bolt or metal band mounting to practically any structure
- Shielding electrodes ensure secondary contingency fault protection

```
Order AFL 26kV Optical Cable Isolator as: ISOL-26KV (includes mounting bracket).

Order connectors as:

OICK YYY/YY XXX LTC

1 inch liquid-tight conduit connection (bottom of isolator only)
OPT-GW cable diameter (in decimal inches)
Cross Sectional Area of OPT-GW strands (mm²)
OICK for Optical Isolator connector kit
```



FIBER OPTIC SHEATH STRIPPER

The AFL Fiber Optic Sheath Stripper is designed to longitudinally score the tight structure fiber units within AFL's OPT-GW. A simple pull of the Sheath Stripper along the fiber unit ensures correct score depth allowing for easy removal of the overall unit sheath and access to the enclosed fibers.

FEATURES & BENEFITS

- Custom designed for AFL fiber units (required for AFL tight structure units)
- Easy-to-use; one quick motion scores the fiber unit to the correct depth
- Supplied with two (2) replacement stainless steel blades
- Easy maintenance and blade adjustment; extremely long life
- Supplied as a kit including sheath stripper, replacement blades, adjustment tool and instructions
- Kit also includes fiber unit samples for practice stripping and blade adjustments
- Reusable



ORDERING INFORMATION

Sheath Size (mm)	Item Number	Unit Fiber Count
2.0	SSA2.0	6 - 8
2.5	SSA2.5	10 - 12
2.7	SSA2.7*	10 - 12
2.75	SSA2.75	14 - 16
3.0	SSA 3.0	24

^{*}Used on the center unit of a 68 fiber AFL OPT-GW cable

Example:

For an AFL OPT-GW with a 2.5mm, 12 fiber count unit, order as SSA2.5.