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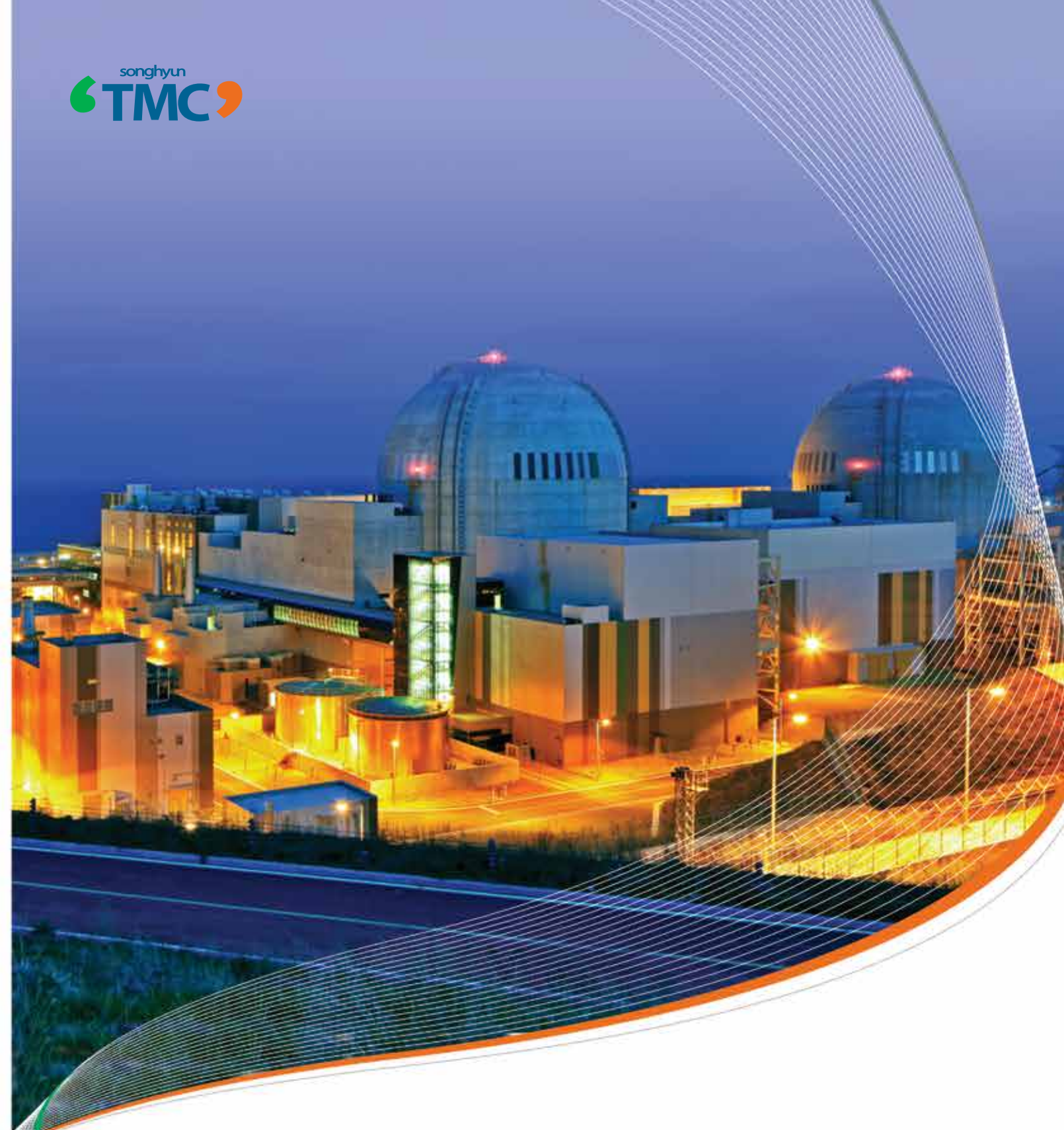
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N-Route[®]
Nuclear power plant Cables

ENTERPRISE WITH DREAM, HOPE, AND FUTURE

TMC Co., Ltd has been pursuing innovation in technology and products for the specialty industrial cable market.

For 30 years TMC has had a single-minded focus on delivering superior customer services with marine and offshore plant cable solutions.

The operational excellence of TMC is underpinned by its products with the best quality and outstanding service to meet specific requirements that makes us the world's most experienced marine and offshore cable manufacturer.

Company History

- 1991 Establishment of Seojin Industry Co.,Ltd.
- 1998 ISO 9001 Certification by LRQA
- 2004 ISO 14001 Certification by LRQA
- 2005 Changed the name of company to TMC Co.,Ltd.
- 2006 Won the 30 million USD Export Tower Award granted by the Ministry of Knowledge Economy
- 2006 Earned recognition by Hyundai Mipo Dockyard Co., Ltd. as one of the excellent suppliers.
- 2007 Won the 70 million USD Export Tower Award granted by the Ministry of Knowledge Economy
- 2007 Received the High quality supplier Certification from DSME
- 2007 Achieved Korean world-class product award 2007
- 2008 Won the 100 million USD Export Tower Award granted by the Ministry of Knowledge Economy
- 2008 OHSAS 18001 Certification by LRQA
- 2009 Awarded the Q-Mark as a Silver grade for Offshore Cable supplier by Samsung Heavy Industries
- 2010 Awarded the Best Supplier for Offshore & Marine Cable by Ocean Rig
- 2010 Earned recognition by DSME as one of the excellent supplier
- 2011 Awarded the Best Supplier for Offshore & Marine Cable by Stena Sphere
- 2011 KEPIC Certification by KEA (Manufacture of Class 1E cable)
- 2012 Won the 200 million USD Export Tower Award granted by the Ministry of Knowledge Economy
- 2013 Designated as 'Korean Hidden Champion' by Korea Eximbank
- 2013 TL9000 certification by SGS (design & manufacture of optical fiber cable)
- 2014 Earned recognition by DSME Excellent supplier
- 2015 Minister Citation by the Ministry of Trade, Industry & Energy
- 2015 Acquisition of Zeepel
- 2016 Acquisition of Glow One (Formerly Posco LED)
- 2017 Awarded 'Certificate of Reliable marine equipment manufacturer&supplier' by KOSHIPA and KOMEA
- 2018 Selected as Best Quality Managed Supplier of Hyundai Heavy Industries(2017)
- 2019 Selected as Best Quality Managed Supplier of Hyundai Heavy Industries(2018)
- 2019 Selected as Best Partner of Samsung Heavy Industries
- 2020 Selected as Best A/S Quality Managed Supplier of DSME(2019)
- 2020 Selected as Best Partner of Samsung Heavy Industries(2020)

Certificates

- Type Approval Certification for MIL-DTL-24643C Military cables : KR
- Type Approval Certification for MIL-DTL-246430 Military cables : KR
- Type Approval Certification for VG 95218 Part. 60~66 Submarine cables : KR
- Type Approval Certification for shipboard cables : ABS, BV, DNV, GL, KR, LR, NK and RINA
- Type Approval Certification for NEK 606(2004) offshore cables : ABS, DNV and LR
- Type Approval Certification by ABS for offshore cables and listed on ETL
- Type Approval Certification for Passenger ships cables : ABS, DNV,LR, BV and CCS
- Obtained Patent of Paint Resistant Shipboard Cables (Patent NO. 10-0627241)
- Type Approval Certification for IEEE1580 Type P cables : ABS, DNV, CSA and listed on ETL
- Type Approval Certification for LNG Carrier cables : ABS, DNV, LR and BV
- Gost-R Certification for NEK 606(2004) offshore cables by GOSSTANDART
- Type Approval Certification for Marine Optical Fiber Cables : ABS and DNV



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HV Power Cable



15kV POWER EPR/FR-PO	06
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15kV POWER EPR/FR-PO

Application Standard

- Design guide : NEMA WC 74(ICEA S-93-639)(2006ed), AEIC CS6(1996ed)
: ASTM B3(2001ed), B8(2004ed), B33(2004ed)
: 9-171-E242
- Flame test : IEEE 383(2003ed), IEEE 1202(1991ed)

Operating Condition & Environmental Design Requirements

- Service Life : 60 years
- Temperature, °F : 50 ~ 122
- Relative Humidity, % : 5 ~ 90
- Radiation TID (Gy) : 1.5 x 10⁴
Total Integrated Dose (TID) for normal condition is a 60 year normal operation dose.

Aging test & Flame test

- Code & Standard : IEEE 383
 - Aging test (Funtional) : 60 year aging test (Voltage withstand + Insulation resistance)
 - Flame test : Unaged & Aged VTFT (IEEE 1202)
- * Refer to Technical Information (Aging & Aged Flame Test Procedure)

Construction

Classification	Code	Construction detail
Conductor		- Tin-coated annealed copper conductor (Class B)
Conductor Shield		- Semi-conducting layer (tape / compound)
Insulation	EPR	- EPR (Class E-I)
Insulation Shield		- Non-metallic part : Semi-conducting layer (compound / tape) - Metallic part : Tinned copper tape - A suitable tape may be applied over the metallic part
Jacket	FR-PO	- Flame retardant Poly-Olefin (FR-PO)
Cabling	Triplex Type	- Jacketed cables shall be assembled
Identification of cores		- Triplex type Cable identification be the priting on the each cable jackets ex) Black, White, Red

8kV POWER EPR/FR-PO

Application Standard

- Design guide : NEMA WC 74(ICEA S-93-639)(2006ed), AEIC CS6(1996ed)
: ASTM B3(2001ed), B8(2004ed), B33(2004ed)
: 9-171-E242
- Flame test : IEEE 383(2003ed), IEEE 1202(1991ed)

Operating Condition & Environmental Design Requirements

- Service Life : 60 years
- Temperature, °F : 50 ~ 122
- Relative Humidity, % : 5 ~ 90
- Radiation TID (Gy) : 1.5 x 10⁴
Total Integrated Dose (TID) for normal condition is a 60 year normal operation dose.

Aging test & Flame test

- Code & Standard : IEEE 383
 - Aging test (Funtional) : 60 year aging test (Voltage withstand + Insulation resistance)
 - Flame test : Unaged & Aged VTFT (IEEE 1202)
- * Refer to Technical Information (Aging & Aged Flame Test Procedure)

Construction

Classification	Code	Construction detail
Conductor		- Tin-coated annealed copper conductor (Class B)
Conductor Shield		- Semi-conducting layer (tape / compound)
Insulation	EPR	- EPR (Class E-I)
Insulation Shield		- Non-metallic part : Semi-conducting layer (compound / tape) - Metallic part : Tinned copper tape - A suitable tape may be applied over the metallic part
Jacket	FR-PO	- Flame retardant Poly-Olefin (FR-PO)
Cabling	Triplex Type	- Jacketed cables shall be assembled
Identification of cores		- Triplex type Cable identification be the priting on the each cable jackets ex) Black, White, Red

HV Power Cable

5kV POWER EPR/FR-PO

Application Standard

- Design guide : NEMA WC 74(ICEA S-93-639)(2006ed), AEIC CS6(1996ed)
: ASTM B3(2001ed), B8(2004ed), B33(2004ed)
: 9-171-E242
- Flame test : IEEE 383(2003ed), IEEE 1202(1991ed)

Operating Condition & Environmental Design Requirements

- Service Life : 60 years
- Temperature, °F : 50 ~ 122
- Relative Humidity, % : 5 ~ 90
- Radiation TID (Gy) : 1.5 x 10⁴
Total Integrated Dose (TID) for normal condition is a 60 year normal operation dose.

Aging test & Flame test

- Code & Standard : IEEE 383
 - Aging test (Funtional) : 60 year aging test (Voltage withstand + Insulation resistance)
 - Flame test : Unaged & Aged VTFT (IEEE 1202)
- * Refer to Technical Information (Aging & Aged Flame Test Procedure)

Construction

Classification	Code	Construction detail
Conductor		- Tin-coated annealed copper conductor (Class B)
Conductor Shield		- Semi-conducting layer (tape / compound)
Insulation	EPR	- EPR (Class E-I)
Insulation Shield		- Non-metallic part : Semi-conducting layer (compound / tape) - Metallic part : Tinned copper tape - A suitable tape may be applied over the metallic part
Jacket	FR-PO	- Flame retardant Poly-Olefin (FR-PO)
Cabling	Triplex Type	- Jacketed cables shall be assembled
Identification of cores		- Triplex type Cable identification be the priting on the each cable jackets ex) Black, White, Red

15kV POWER EPR/FR-PO

No. of Core	Conductor			Thickness of Insulation		Thickness of Jacket		Overall Diameter		Max. Conductor Resistance (at 25℃)		Insulation Resistance Constant (at 15.6℃)	Test Voltage	Cable Weight
	Nominal Area	Number of wire	Diameter of conductor	Min. average		Minimum		Approx.	Maximum					
No.	AWG/KCM	EA.	mm	mils	mm	mils	mm	mm	mm	Ω/1000ft	Ω/km	MΩ-km	kV/5min.	kg/km
1/C	1/0	19	9.47	260	6.60	70	1.78	31.6	33.2	0.108	0.355	6,096	52	1530
	2/0	19	10.64	260	6.60	70	1.78	33.2	34.9	0.0859	0.282	6,096	52	1750
	3/0	19	11.94	260	6.60	70	1.78	34.5	36.3	0.0680	0.223	6,096	52	1980
	4/0	19	13.41	260	6.60	70	1.78	36.0	37.8	0.0534	0.175	6,096	52	2250
	250	37	14.61	260	6.60	70	1.78	37.2	39.1	0.0457	0.150	6,096	52	2490
	300	37	16.00	260	6.60	70	1.78	38.6	40.5	0.0381	0.125	6,096	52	2800
	350	37	17.30	260	6.60	70	1.78	39.9	41.9	0.0326	0.107	6,096	52	3090
	400	37	18.49	260	6.60	70	1.78	41.4	43.5	0.0283	0.0927	6,096	52	3420
	500	37	20.65	260	6.60	100	2.54	45.0	47.2	0.0226	0.0743	6,096	52	4150
	750	61	25.35	260	6.60	100	2.54	50.1	52.6	0.0151	0.0495	6,096	52	5630
	1000	61	29.26	260	6.60	100	2.54	54.0	56.7	0.0113	0.0371	6,096	52	6990

8kV POWER EPR/FR-PO

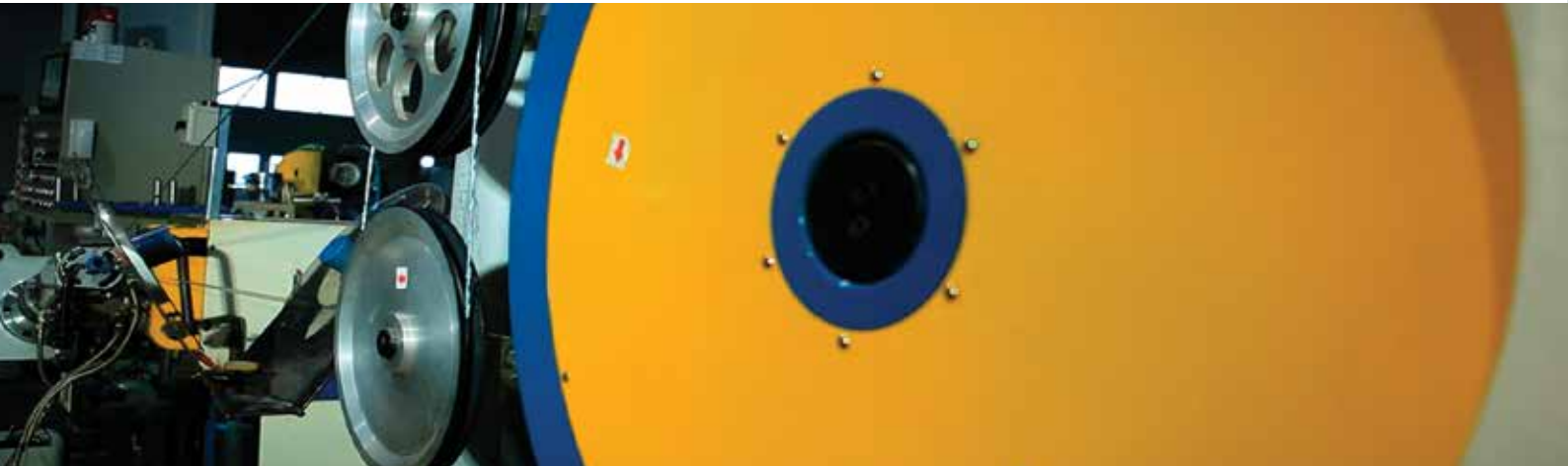
No. of Core	Conductor			Thickness of Insulation		Thickness of Jacket		Overall Diameter		Max. Conductor Resistance (at 25℃)		Insulation Resistance Constant (at 15.6℃)	Test Voltage	Cable Weight
	Nominal Area	Number of wire	Diameter of conductor	Min. average		Minimum		Approx.	Maximum					
No.	AWG/KCM	EA.	mm	mils	mm	mils	mm	mm	mm	Ω/1000ft	Ω/km	MΩ-km	kV/5min.	kg/km
1/C	1/0	19	9.47	175	4.45	70	1.78	27.4	28.8	0.108	0.355	6,096	35	1270
	2/0	19	10.64	175	4.45	70	1.78	28.6	30.1	0.0859	0.282	6,096	35	1450
	3/0	19	11.94	175	4.45	70	1.78	29.9	31.4	0.0680	0.223	6,096	35	1670
	4/0	19	13.41	175	4.45	70	1.78	31.4	32.9	0.0534	0.175	6,096	35	1930
	250	37	14.61	175	4.45	70	1.78	33.0	34.7	0.0457	0.150	6,096	35	2190
	300	37	16.00	175	4.45	70	1.78	34.4	36.1	0.0381	0.125	6,096	35	2480
	350	37	17.30	175	4.45	70	1.78	35.7	37.5	0.0326	0.107	6,096	35	2770
	400	37	18.49	175	4.45	70	1.78	37.2	39.1	0.0283	0.0927	6,096	35	3080
	500	37	20.65	175	4.45	70	1.78	39.4	41.3	0.0226	0.0743	6,096	35	3640
	750	61	25.35	175	4.45	100	2.54	45.5	47.8	0.0151	0.0495	6,096	35	5180
	1000	61	29.26	175	4.45	100	2.54	49.8	52.3	0.0113	0.0371	6,096	35	6550

5kV POWER EPR/FR-PO

No. of Core	Conductor			Thickness of Insulation		Thickness of Jacket		Overall Diameter		Max. Conductor Resistance (at 25℃)		Insulation Resistance Constant (at 15.6℃)	Test Voltage	Cable Weight
	Nominal Area	Number of wire	Diameter of conductor	Min. average		Minimum		Approx.	Maximum					
No.	AWG/KCM	EA.	mm	mils	mm	mils	mm	mm	mm	Ω/1000ft	Ω/km	MΩ-km	kV/5min.	kg/km
1/C	1/0	19	9.47	115	2.92	70	1.78	24.2	25.4	0.108	0.355	6,096	23	1100
	2/0	19	10.64	115	2.92	70	1.78	25.4	26.7	0.0859	0.282	6,096	23	1270
	3/0	19	11.94	115	2.92	70	1.78	26.7	28.1	0.0680	0.223	6,096	23	1480
	4/0	19	13.41	115	2.92	70	1.78	28.2	29.6	0.0534	0.175	6,096	23	1730
	250	37	14.61	115	2.92	70	1.78	29.4	30.9	0.0457	0.150	6,096	23	1950
	300	37	16.00	115	2.92	70	1.78	30.8	32.4	0.0381	0.125	6,096	23	2240
	350	37	17.30	115	2.92	70	1.78	32.5	34.1	0.0326	0.107	6,096	23	2540
	400	37	18.49	115	2.92	70	1.78	34.0	35.7	0.0283	0.0927	6,096	23	2840
	500	37	20.65	115	2.92	70	1.78	36.2	38.0	0.0226	0.0743	6,096	23	3390
	750	61	25.35	115	2.92	70	1.78	40.9	43.0	0.0151	0.0495	6,096	23	4740
	1000	61	29.26	115	2.92	100	2.54	46.2	48.5	0.0113	0.0371	6,096	23	6200



LV Power Cable



600V POWER EPR/FR-PO	11 ~ 13
600V POWER EPR/FR-PO (Triplex)	14 ~ 15
600V POWER EPR/FR-PO-S	16 ~ 18



LV Power Cable

600V POWER EPR/FR-PO

Application Standard

- Design guide : NEMA WC 70(ICEA S-95-658)(2009ed)
: ASTM B3(2001ed), B8(2004ed), B33(2004ed)
: 9-171-E242
- Flame test : IEEE 383(2003ed), IEEE 1202(1991ed), UL 1581(2001ed)

Operating Condition & Environmental Design Requirements

- Service Life : 60 years
- Temperature, °F : 50 ~ 122
- Relative Humidity, % : 5 ~ 90
- Radiation TID (Gy) : 1.5 x 10⁴
Total Integrated Dose (TID) for normal condition is a 60 year normal operation dose.

Aging test & Flame test

- Code & Standard : IEEE 383
 - Aging test (Funtional) : 60 year aging test (Voltage withstand + Insulation resistance)
 - Flame test : Unaged & Aged VTFT (IEEE 1202), VFT (UL 1581)
- * Refer to Technical Information (Aging & Aged Flame Test Procedure)

Construction

Classification	Code	Construction detail
Conductor		- Tin-coated annealed copper conductor (Class B)
Insulation	EPR	- EPR (Class E-II)
Cabling		- Insulated cores shall be assembled - Filler, if uesd, shall be non-hygroscopic and flame-retardant - A binder tape may be used over the assembly
Jacket	FR-PO	- Flame retardant Poly-Olefin (FR-PO)
Identification of cores		- 1Core : Black - 2Cores : Black, White - 3Cores : Black, White, Red - 4Cores : Black, White, Red, Green - Multi Core : Identified for Method 3 as per NEMA WC 57, Appendix E

LV Power Cable

600V POWER EPR/FR-PO

No. of Core	Conductor			Thickness of Insulation				Thickness of Jacket				Overall Diameter		Max. Conductor Resistance (at 25°C)		Insulation Resistance Constant (at 15.6°C)	Test Voltage	Cable Weight
	Nominal Area	Number of wire	Diameter of conductor	Nominal		Minimum		Nominal		Minimum		Approx.	Maximum					
No.	AWG/KCM	EA.	mm	mils	mm	mils	mm	mils	mm	mils	mm	mm	mm	Ω/1000ft	Ω/km	MΩ-km	KV/5min.	kg/km
1C	14	7	1.84	45	1.143	40	1.016	15	0.38	13	0.330	6.4	6.9	2.78	8.66	3,048	5.5	80
	12	7	2.31	45	1.143	40	1.016	15	0.38	13	0.330	6.8	7.4	1.75	5.75	3,048	5.5	100
	10	7	2.95	45	1.143	40	1.016	15	0.38	13	0.330	7.4	8.0	1.10	3.61	3,048	5.5	120
	9	7	3.30	45	1.143	40	1.016	15	0.38	13	0.330	7.8	8.4	0.873	2.86	3,048	5.5	140
	8	7	3.71	55	1.397	50	1.270	30	0.76	25	0.635	8.7	9.4	0.692	2.26	3,048	7.0	170
	7	7	4.17	55	1.397	50	1.270	30	0.76	25	0.635	9.1	9.9	0.549	1.80	3,048	7.0	200
	6	7	4.67	55	1.397	50	1.270	30	0.76	25	0.635	9.8	10.5	0.436	1.43	3,048	7.0	240
	5	7	5.23	55	1.397	50	1.270	30	0.76	25	0.635	10.3	11.2	0.345	1.13	3,048	7.0	280
	4	7	5.89	55	1.397	50	1.270	30	0.76	25	0.635	11.0	11.8	0.274	0.900	3,048	7.0	330
	3	7	6.60	55	1.397	50	1.270	30	0.76	25	0.635	11.7	12.6	0.217	0.713	3,048	7.0	390
	2	7	7.42	55	1.397	50	1.270	30	0.76	25	0.635	12.5	13.5	0.172	0.565	3,048	7.0	470
	1	19	8.43	65	1.651	60	1.524	45	1.14	40	1.02	14.6	15.8	0.137	0.449	3,048	8.0	620
	1/0	19	9.47	65	1.651	60	1.524	45	1.14	40	1.02	15.6	16.9	0.108	0.355	3,048	8.0	740
	2/0	19	10.64	65	1.651	60	1.524	45	1.14	40	1.02	16.8	18.2	0.0859	0.282	3,048	8.0	900
	3/0	19	11.94	65	1.651	60	1.524	45	1.14	40	1.02	18.1	19.6	0.0680	0.223	3,048	8.0	1090
	4/0	19	13.41	65	1.651	60	1.524	45	1.14	40	1.02	19.6	21.1	0.0534	0.175	3,048	8.0	1330
	250	37	14.61	75	1.905	70	1.778	65	1.65	60	1.52	22.3	24.1	0.0457	0.150	3,048	9.5	1630
	300	37	16.00	75	1.905	70	1.778	65	1.65	60	1.52	23.7	25.6	0.0381	0.125	3,048	9.5	1910
	350	37	17.30	75	1.905	70	1.778	65	1.65	60	1.52	25.4	27.4	0.0326	0.107	3,048	9.5	2190
	400	37	18.49	75	1.905	70	1.778	65	1.65	60	1.52	26.6	27.9	0.0283	0.0927	3,048	9.5	2400
500	37	20.65	75	1.905	70	1.778	65	1.65	60	1.52	28.7	30.2	0.0226	0.0743	3,048	9.5	2920	
750	61	25.35	90	2.286	85	2.159	65	1.65	60	1.52	34.3	36.0	0.0151	0.0495	3,048	11.5	4290	
1000	61	29.26	90	2.286	85	2.159	65	1.65	60	1.52	38.1	40.0	0.0113	0.0371	3,048	11.5	5560	
2C	14	7	1.84	45	1.143	40	1.016	45	1.14	40	1.02	11.4	12.3	2.84	8.83	3,048	5.5	170
	12	7	2.31	45	1.143	40	1.016	45	1.14	40	1.02	12.4	13.3	1.79	5.87	3,048	5.5	210
	10	7	2.95	45	1.143	40	1.016	60	1.52	50	1.27	14.4	15.5	1.12	3.68	3,048	5.5	310
	9	7	3.30	45	1.143	40	1.016	60	1.52	50	1.27	15.1	16.3	0.891	2.91	3,048	5.5	350
	8	7	3.71	55	1.397	50	1.270	60	1.52	50	1.27	16.9	18.2	0.705	2.31	3,048	7.0	440
	7	7	4.17	55	1.397	50	1.270	60	1.52	50	1.27	17.8	19.2	0.560	1.83	3,048	7.0	500
	6	7	4.67	55	1.397	50	1.270	60	1.52	50	1.27	19.0	20.5	0.444	1.46	3,048	7.0	590
	5	7	5.23	55	1.397	50	1.270	60	1.52	50	1.27	20.2	21.8	0.352	1.15	3,048	7.0	690
	4	7	5.89	55	1.397	50	1.270	80	2.03	70	1.78	22.4	24.2	0.280	0.918	3,048	7.0	890
	3	7	6.60	55	1.397	50	1.270	80	2.03	70	1.78	23.9	25.8	0.222	0.727	3,048	7.0	1040
	2	7	7.42	55	1.397	50	1.270	80	2.03	70	1.78	25.5	27.5	0.176	0.576	3,048	7.0	1240
	1	19	8.43	65	1.651	60	1.524	80	2.03	70	1.78	28.6	30.0	0.139	0.458	3,048	8.0	1540
	1/0	19	9.47	65	1.651	60	1.524	80	2.03	70	1.78	30.6	32.1	0.110	0.362	3,048	8.0	1830
	2/0	19	10.64	65	1.651	60	1.524	80	2.03	70	1.78	33.0	34.6	0.0876	0.287	3,048	8.0	2210
	3/0	19	11.94	65	1.651	60	1.524	80	2.03	70	1.78	35.6	37.3	0.0694	0.228	3,048	8.0	2670
	4/0	19	13.41	65	1.651	60	1.524	80	2.03	70	1.78	38.5	40.4	0.0545	0.179	3,048	8.0	3230
	250	37	14.61	75	1.905	70	1.778	80	2.03	70	1.78	41.9	44.0	0.0466	0.153	3,048	9.5	3810
	300	37	16.00	75	1.905	70	1.778	110	2.79	95	2.41	46.3	48.6	0.0389	0.128	3,048	9.5	4780
	350	37	17.30	75	1.905	70	1.778	110	2.79	95	2.41	49.6	52.1	0.0333	0.109	3,048	9.5	5490
	400	37	18.49	75	1.905	70	1.778	110	2.79	95	2.41	52.0	54.6	0.0288	0.0946	3,048	9.5	6150
500	37	20.65	75	1.905	70	1.778	110	2.79	95	2.41	56.4	59.2	0.0231	0.0757	3,048	9.5	7430	
750	61	25.35	90	2.286	85	2.159	110	2.79	95	2.41	67.4	70.8	0.0154	0.0505	3,048	11.5	10880	
1000	61	29.26	90	2.286	85	2.159	140	3.56	120	3.05	76.8	80.6	0.0115	0.0379	3,048	11.5	14710	



600V POWER EPR/FR-PO

No. of Core	Conductor			Thickness of Insulation				Thickness of Jacket				Overall Diameter		Max. Conductor Resistance (at 25°C)		Insulation Resistance Constant (at 15.6°C)	Test Voltage	Cable Weight
	Nominal Area	Number of wire	Diameter of conductor	Nominal		Minimum		Nominal		Minimum		Approx.	Maximum					
No.	AWG/KCM	EA.	mm	mils	mm	mils	mm	mils	mm	mils	mm	mm	mm	Ω/1000ft	Ω/km	MΩ-km	KV/5min.	kg/km
3C	14	7	1.84	45	1.143	40	1.016	45	1.14	40	1.02	12.1	13.0	2.84	8.83	3,048	5.5	210
	12	7	2.31	45	1.143	40	1.016	60	1.52	50	1.27	13.9	15.0	1.79	5.87	3,048	5.5	300
	10	7	2.95	45	1.143	40	1.016	60	1.52	50	1.27	15.2	16.4	1.12	3.68	3,048	5.5	380
	9	7	3.30	45	1.143	40	1.016	60	1.52	50	1.27	16.0	17.2	0.891	2.91	3,048	5.5	440
	8	7	3.71	55	1.397	50	1.270	60	1.52	50	1.27	17.9	19.3	0.705	2.31	3,048	7.0	550
	7	7	4.17	55	1.397	50	1.270	60	1.52	50	1.27	18.9	20.4	0.560	1.83	3,048	7.0	640
	6	7	4.67	55	1.397	50	1.270	60	1.52	50	1.27	20.2	21.8	0.444	1.46	3,048	7.0	760
	5	7	5.23	55	1.397	50	1.270	80	2.03	70	1.78	22.4	24.2	0.352	1.15	3,048	7.0	970
	4	7	5.89	55	1.397	50	1.270	80	2.03	70	1.78	23.8	25.7	0.280	0.918	3,048	7.0	1140
	3	7	6.60	55	1.397	50	1.270	80	2.03	70	1.78	25.3	27.4	0.222	0.727	3,048	7.0	1350
	2	7	7.42	55	1.397	50	1.270	80	2.03	70	1.78	27.1	28.4	0.176	0.576	3,048	7.0	1620
	1	19	8.43	65	1.651	60	1.524	80	2.03	70	1.78	30.4	31.9	0.139	0.458	3,048	8.0	2020
	1/0	19	9.47	65	1.651	60	1.524	80	2.03	70	1.78	32.6	34.2	0.110	0.362	3,048	8.0	2420
	2/0	19	10.64	65	1.651	60	1.524	80	2.03	70	1.78	35.2	36.9	0.0876	0.287	3,048	8.0	2940
	3/0	19	11.94	65	1.651	60	1.524	80	2.03	70	1.78	38.0	39.8	0.0694	0.228	3,048	8.0	3570
	4/0	19	13.41	65	1.651	60	1.524	80	2.03	70	1.78	41.1	43.1	0.0545	0.179	3,048	8.0	4340
	250	37	14.61	75	1.905	70	1.778	110	2.79	95	2.41	46.4	48.7	0.0466	0.153	3,048	9.5	5460
	300	37	16.00	75	1.905	70	1.778	110	2.79	95	2.41	49.4	51.9	0.0389	0.128	3,048	9.5	6370
	350	37	17.30	75	1.905	70	1.778	110	2.79	95	2.41	53.0	55.7	0.0333	0.109	3,048	9.5	7340
	400	37	18.49	75	1.905	70	1.778	110	2.79	95	2.41	55.6	58.3	0.0288	0.0946	3,048	9.5	8240
500	37	20.65	75	1.905	70	1.778	110	2.79	95	2.41	60.2	63.3	0.0231	0.0757	3,048	9.5	10020	
750	61	25.35	90	2.286	85	2.159	140	3.56	120	3.05	73.8	77.4	0.0154	0.0505	3,048	11.5	15410	
1000	61	29.26	90	2.286	85	2.159	140	3.56	120	3.05	82.1	86.2	0.0115	0.0379	3,048	11.5	19850	
4C	14	7	1.84	45	1.143	40	1.016	45	1.14	40	1.02	13.2	14.3	2.84	8.83	3,048	5.5	260
	12	7	2.31	45	1.143	40	1.016	60	1.52	50	1.27	15.2	16.4	1.79	5.87	3,048	5.5	360
	10	7	2.95	45	1.143	40	1.016	60	1.52	50	1.27	16.6	17.9	1.12	3.68	3,048	5.5	470
	9	7	3.30	45	1.143	40	1.016	60	1.52	50	1.27	17.5	18.9	0.891	2.91	3,048	5.5	550
	8	7	3.71	55	1.397	50	1.270	60	1.52	50	1.27	19.6	21.2	0.705	2.31	3,048	7.0	690
	7	7	4.17	55	1.397	50	1.270	60	1.52	50	1.27	20.7	22.4	0.560	1.83	3,048	7.0	800
	6	7	4.67	55	1.397	50	1.270	80	2.03	70	1.78	23.2	25.1	0.444	1.46	3,048	7.0	1040
	5	7	5.23	55	1.397	50	1.270	80	2.03	70	1.78	24.6	26.6	0.352	1.15	3,048	7.0	1220
	4	7	5.89	55	1.397	50	1.270	80	2.03	70	1.78	26.1	27.4	0.280	0.918	3,048	7.0	1440
	3	7	6.60	55	1.397	50	1.270	80	2.03	70	1.78	27.9	29.2	0.222	0.727	3,048	7.0	1720
	2	7	7.42	55	1.397	50	1.270	80	2.03	70	1.78	29.8	31.3	0.176	0.576	3,048	7.0	2060
	1	19	8.43	65	1.651	60	1.524	80	2.03	70	1.78	33.5	35.2	0.139	0.458	3,048	8.0	2580
	1/0	19	9.47	65	1.651	60	1.524	80	2.03	70	1.78	35.9	37.7	0.110	0.362	3,048	8.0	3100
	2/0	19	10.64	65	1.651	60	1.524	80	2.03	70	1.78	38.8	40.8	0.0876	0.287	3,048	8.0	3780
	3/0	19	11.94	65	1.651	60	1.524	80	2.03	70	1.78	42.0	44.1	0.0694	0.228	3,048	8.0	4600
	4/0	19	13.41	65	1.651	60	1.524	110	2.79	95	2.41	47.1	49.4	0.0545	0.179	3,048	8.0	5940
	250	37	14.61	75	1.905	70	1.778	110	2.79	95	2.41	51.3	53.8	0.0466	0.153	3,048	9.5	7010
	300	37	16.00	75	1.905	70	1.778	110	2.79	95	2.41	54.6	57.4	0.0389	0.128	3,048	9.5	8200
	350	37	17.30	75	1.905	70	1.778	110	2.79	95	2.41	58.6	61.6	0.0333	0.109	3,048	9.5	9460
	400	37	18.49	75	1.905	70	1.778	110	2.79	95	2.41	61.5	64.6	0.0288	0.0946	3,048	9.5	10630
500	37	20.65	75	1.905	70	1.778	110	2.79	95	2.41	66.8	70.1	0.0231	0.0757	3,048	9.5	12950	
750	61	25.35	90	2.286	85	2.159	140	3.56	120	3.05	81.7	85.8	0.0154	0.0505	3,048	11.5	19890	
1000	61	29.26	90	2.286	85	2.159	140	3.56	120	3.05	91.0	95.6	0.0115	0.0379	3,048	11.5	25680	

LV Power Cable

600V POWER EPR/FR-PO (Triplex)

Application Standard

- Design guide : NEMA WC 70(ICEA S-95-658)(2009ed)
: ASTM B3(2001ed), B8(2004ed), B33(2004ed)
: 9-171-E242
- Flame test : IEEE 383(2003ed), IEEE 1202(1991ed), UL 1581(2001ed)

Operating Condition & Environmental Design Requirements

- Service Life : 60 years
- Temperature, °F : 50 ~ 122
- Relative Humidity, % : 5 ~ 90
- Radiation TID (Gy) : 1.5 x 10⁴
Total Integrated Dose (TID) for normal condition is a 60 year normal operation dose.

Aging test & Flame test

- Code & Standard : IEEE 383
 - Aging test (Funtional) : 60 year aging test (Voltage withstand + Insulation resistance)
 - Flame test : Unaged & Aged VTFT (IEEE 1202), VFT (UL 1581)
- * Refer to Technical Information (Aging & Aged Flame Test Procedure)

Construction

Classification	Code	Construction detail
Conductor		- Tin-coated annealed copper conductor (Class B)
Insulation	EPR	- EPR (Class E-II)
Jacket	FR-PO	- Flame retardant Poly-Olefin (FR-PO)
Cabling	Triplex Type	- Jacketed cables shall be assembled
Identification of cores		- 3Cores : Black, White, Red

600V POWER EPR/FR-PO (Triplex)

No. of Core	Conductor			Thickness of Insulation				Thickness of Jacket				Overall Diameter		Max. Conductor Resistance (at 25℃)		Insulation Resistance Constant (at 15.6℃)	Test Voltage	Cable Weight
	Nominal Area	Number of wire	Diameter of conductor	Nominal		Minimum		Nominal		Minimum		Approx.	Maximum					
No.	AWG/KCM	EA.	mm	mils	mm	mils	mm	mils	mm	mils	mm	mm	mm	Ω/1000ft	Ω/km	MΩ-km	KV/5min.	kg/km
3C	14	7	1.84	45	1.143	40	1.016	15	0.38	13	0.33	14.0	15.1	2.84	8.83	3,048	5.5	200
	12	7	2.31	45	1.143	40	1.016	15	0.38	13	0.33	15.0	16.2	1.79	5.87	3,048	5.5	250
	10	7	2.95	45	1.143	40	1.016	15	0.38	13	0.33	16.3	17.6	1.12	3.68	3,048	5.5	330
	9	7	3.30	45	1.143	40	1.016	15	0.38	13	0.33	17.1	18.5	0.891	2.91	3,048	5.5	380
	8	7	3.71	55	1.397	50	1.270	30	0.76	25	0.64	19.0	20.6	0.705	2.31	3,048	7.0	470
	7	7	4.17	55	1.397	50	1.270	30	0.76	25	0.64	20.0	21.6	0.560	1.83	3,048	7.0	550
	6	7	4.67	55	1.397	50	1.270	30	0.76	25	0.64	21.3	23.0	0.444	1.46	3,048	7.0	650
	5	7	5.23	55	1.397	50	1.270	30	0.76	25	0.64	22.6	24.4	0.352	1.15	3,048	7.0	780
	4	7	5.89	55	1.397	50	1.270	30	0.76	25	0.64	23.9	25.8	0.280	0.918	3,048	7.0	920
	3	7	6.60	55	1.397	50	1.270	30	0.76	25	0.64	25.5	27.5	0.222	0.727	3,048	7.0	1110
	2	7	7.42	55	1.397	50	1.270	30	0.76	25	0.64	27.2	28.6	0.176	0.576	3,048	7.0	1340
	1	19	8.43	65	1.651	60	1.524	45	1.14	40	1.02	31.8	33.4	0.139	0.458	3,048	8.0	1740
	1/0	19	9.47	65	1.651	60	1.524	45	1.14	40	1.02	34.0	35.7	0.110	0.362	3,048	8.0	2090
	2/0	19	10.64	65	1.651	60	1.524	45	1.14	40	1.02	36.6	38.4	0.0876	0.287	3,048	8.0	2560
	3/0	19	11.94	65	1.651	60	1.524	45	1.14	40	1.02	39.4	41.3	0.0694	0.228	3,048	8.0	3120
	4/0	19	13.41	65	1.651	60	1.524	45	1.14	40	1.02	42.5	44.6	0.0545	0.179	3,048	8.0	3810
	250	37	14.61	75	1.905	70	1.778	65	1.65	60	1.52	48.4	50.8	0.0466	0.153	3,048	9.5	4670
	300	37	16.00	75	1.905	70	1.778	65	1.65	60	1.52	51.4	53.9	0.0389	0.128	3,048	9.5	5470
	350	37	17.30	75	1.905	70	1.778	65	1.65	60	1.52	55.0	57.7	0.0333	0.109	3,048	9.5	6290
	400	37	18.49	75	1.905	70	1.778	65	1.65	60	1.52	57.5	60.4	0.0288	0.0946	3,048	9.5	7080
	500	37	20.65	75	1.905	70	1.778	65	1.65	60	1.52	62.2	65.3	0.0231	0.0757	3,048	9.5	8640
	750	61	25.35	90	2.286	85	2.159	65	1.65	60	1.52	74.1	77.8	0.0154	0.0505	3,048	11.5	12720
	1000	61	29.26	90	2.286	85	2.159	65	1.65	60	1.52	82.5	86.6	0.0115	0.0379	3,048	11.5	16530

LV Power Cable

600V POWER EPR/FR-PO-S

Application Standard

- Design guide : NEMA WC 70(ICEA S-95-658)(2009ed)
: ASTM B3(2001ed), B8(2004ed), B33(2004ed)
: 9-171-E242
- Flame test : IEEE 383(2003ed), IEEE 1202(1991ed), UL 1581(2001ed)

Operating Condition & Environmental Design Requirements

- Service Life : 60 years
- Temperature, °F : 50 ~ 122
- Relative Humidity, % : 5 ~ 90
- Radiation TID (Gy) : 1.5 x 10⁴
Total Integrated Dose (TID) for normal condition is a 60 year normal operation dose.

Aging test & Flame test

- Code & Standard : IEEE 383
 - Aging test (Funtional) : 60 year aging test (Voltage withstand + Insulation resistance)
 - Flame test : Unaged & Aged VTFT (IEEE 1202), VFT (UL 1581)
- * Refer to Technical Information (Aging & Aged Flame Test Procedure)

Construction

Classification	Code	Construction detail
Conductor		- Tin-coated annealed copper conductor (Class B)
Insulation	EPR	- EPR (Class E-II)
Cabling		- Insulated cores shall be assembled - Filler, if uesd, shall be non-hygroscopic and flame-retardant - A binder tape may be used over the assembly
Shield	- S	- Tin-coated copper tape - A suitable tape may be applied over the shield
Jacket	FR-PO	- Flame retardant Poly-Olefin (FR-PO)
Identification of cores		- 1Core : Black - 2Cores : Black, White - 3Cores : Black, White, Red - 4Cores : Black, White, Red, Green - Multi Core : Identified for Method 3 as per NEMA WC 57, Appendix E



600V POWER EPR/FR-PO-S

No. of Core	Conductor			Thickness of Insulation				Thickness of Jacket				Overall Diameter		Max. Conductor Resistance (at 25°C)		Insulation Resistance Constant (at 15.6°C)	Test Voltage	Cable Weight
	Nominal Area	Number of wire	Diameter of conductor	Nominal		Minimum		Nominal		Minimum		Approx.	Maximum	Ω/1000ft	Ω/km			
No.	AWG/KCM	EA.	mm	mils	mm	mils	mm	mils	mm	mils	mm	mm	mm	Ω/1000ft	Ω/km	MΩ-km	KV/5min.	kg/km
1C	14	7	1.84	45	1.143	40	1.016	45	1.14	40	1.02	7.4	8.0	2.78	8.66	3,048	5.5	100
	12	7	2.31	45	1.143	40	1.016	45	1.14	40	1.02	7.9	8.5	1.75	5.75	3,048	5.5	120
	10	7	2.95	45	1.143	40	1.016	45	1.14	40	1.02	8.5	9.1	1.10	3.61	3,048	5.5	150
	9	7	3.30	45	1.143	40	1.016	45	1.14	40	1.02	8.8	9.5	0.873	2.86	3,048	5.5	170
	8	7	3.71	55	1.397	50	1.270	45	1.14	40	1.02	9.7	10.5	0.692	2.26	3,048	7.0	200
	7	7	4.17	55	1.397	50	1.270	45	1.14	40	1.02	10.2	11.0	0.549	1.80	3,048	7.0	230
	6	7	4.67	55	1.397	50	1.270	45	1.14	40	1.02	10.8	11.7	0.436	1.43	3,048	7.0	270
	5	7	5.23	55	1.397	50	1.270	45	1.14	40	1.02	11.4	12.3	0.345	1.13	3,048	7.0	310
	4	7	5.89	55	1.397	50	1.270	45	1.14	40	1.02	12.0	13.0	0.274	0.900	3,048	7.0	360
	3	7	6.60	55	1.397	50	1.270	45	1.14	40	1.02	12.7	13.7	0.217	0.713	3,048	7.0	430
	2	7	7.42	55	1.397	50	1.270	60	1.52	50	1.27	14.3	15.5	0.172	0.565	3,048	7.0	540
	1	19	8.43	65	1.651	60	1.524	60	1.52	50	1.27	15.9	17.1	0.137	0.449	3,048	8.0	670
	1/0	19	9.47	65	1.651	60	1.524	60	1.52	50	1.27	16.9	18.2	0.108	0.355	3,048	8.0	790
	2/0	19	10.64	65	1.651	60	1.524	60	1.52	50	1.27	18.1	19.5	0.0859	0.282	3,048	8.0	960
	3/0	19	11.94	65	1.651	60	1.524	60	1.52	50	1.27	19.4	20.9	0.0680	0.223	3,048	8.0	1150
	4/0	19	13.41	65	1.651	60	1.524	60	1.52	50	1.27	20.8	22.5	0.0534	0.175	3,048	8.0	1390
	250	37	14.61	75	1.905	70	1.778	80	2.03	70	1.78	23.6	25.4	0.0457	0.150	3,048	9.5	1710
	300	37	16.00	75	1.905	70	1.778	80	2.03	70	1.78	25.0	26.9	0.0381	0.125	3,048	9.5	1990
	350	37	17.30	75	1.905	70	1.778	80	2.03	70	1.78	26.6	27.9	0.0326	0.107	3,048	9.5	2280
	400	37	18.49	75	1.905	70	1.778	80	2.03	70	1.78	27.8	29.2	0.0283	0.0927	3,048	9.5	2550
500	37	20.65	75	1.905	70	1.778	80	2.03	70	1.78	30.0	31.5	0.0226	0.0743	3,048	9.5	3100	
750	61	25.35	90	2.286	85	2.159	80	2.03	70	1.78	35.5	37.3	0.0151	0.0495	3,048	11.5	4520	
1000	61	29.26	90	2.286	85	2.159	80	2.03	70	1.78	39.4	41.3	0.0113	0.0371	3,048	11.5	5820	
2C	14	7	1.84	45	1.143	40	1.016	45	1.14	40	1.02	11.7	12.7	2.84	8.83	3,048	5.5	210
	12	7	2.31	45	1.143	40	1.016	45	1.14	40	1.02	12.7	13.7	1.79	5.87	3,048	5.5	260
	10	7	2.95	45	1.143	40	1.016	60	1.52	50	1.27	14.7	15.9	1.12	3.68	3,048	5.5	360
	9	7	3.30	45	1.143	40	1.016	60	1.52	50	1.27	15.4	16.7	0.891	2.913	3,048	5.5	400
	8	7	3.71	55	1.397	50	1.270	60	1.52	50	1.27	17.2	18.6	0.705	2.310	3,048	7.0	500
	7	7	4.17	55	1.397	50	1.270	60	1.52	50	1.27	18.1	19.6	0.560	1.831	3,048	7.0	560
	6	7	4.67	55	1.397	50	1.270	60	1.52	50	1.27	19.4	20.9	0.444	1.457	3,048	7.0	660
	5	7	5.23	55	1.397	50	1.270	60	1.52	50	1.27	20.5	22.1	0.352	1.155	3,048	7.0	760
	4	7	5.89	55	1.397	50	1.270	80	2.03	70	1.78	22.8	24.6	0.280	0.918	3,048	7.0	960
	3	7	6.60	55	1.397	50	1.270	80	2.03	70	1.78	24.2	26.1	0.222	0.727	3,048	7.0	1130
	2	7	7.42	55	1.397	50	1.270	80	2.03	70	1.78	25.8	27.1	0.176	0.576	3,048	7.0	1330
	1	19	8.43	65	1.651	60	1.524	80	2.03	70	1.78	28.9	30.3	0.139	0.458	3,048	8.0	1650
	1/0	19	9.47	65	1.651	60	1.524	80	2.03	70	1.78	30.9	32.4	0.1103	0.3621	3,048	8.0	1940
	2/0	19	10.64	65	1.651	60	1.524	80	2.03	70	1.78	33.3	35.0	0.0876	0.2872	3,048	8.0	2330
	3/0	19	11.94	65	1.651	60	1.524	80	2.03	70	1.78	35.9	37.7	0.0694	0.2278	3,048	8.0	2800
	4/0	19	13.41	65	1.651	60	1.524	80	2.03	70	1.78	38.8	40.7	0.0545	0.1789	3,048	8.0	3370
	250	37	14.61	75	1.905	70	1.778	80	2.03	70	1.78	42.3	44.4	0.0466	0.1529	3,048	9.5	3970
	300	37	16.00	75	1.905	70	1.778	110	2.79	95	2.41	46.7	49.0	0.0389	0.1280	3,048	9.5	4950
	350	37	17.30	75	1.905	70	1.778	110	2.79	95	2.41	50.0	52.5	0.0333	0.1092	3,048	9.5	5680
	400	37	18.49	75	1.905	70	1.778	110	2.79	95	2.41	52.4	55.0	0.0288	0.0946	3,048	9.5	6340
500	37	20.65	75	1.905	70	1.778	110	2.79	95	2.41	56.7	59.5	0.0231	0.0757	3,048	9.5	7650	
750	61	25.35	90	2.286	85	2.159	110	2.79	95	2.41	67.8	71.1	0.0154	0.0505	3,048	11.5	11140	
1000	61	29.26	90	2.286	85	2.159	140	3.56	120	3.05	77.1	80.9	0.0115	0.0379	3,048	11.5	15010	

LV Power Cable

600V POWER EPR/FR-PO-S

No. of Core	Conductor			Thickness of Insulation				Thickness of Jacket				Overall Diameter		Max. Conductor Resistance (at 25°C)		Insulation Resistance Constant (at 15.6°C)	Test Voltage	Cable Weight
	Nominal Area	Number of wire	Diameter of conductor	Nominal		Minimum		Nominal		Minimum		Approx.	Maximum					
No.	AWG/KCM	EA.	mm	mil	mm	mil	mm	mil	mm	mil	mm	mm	mm	Ω/1000ft	Ω/km	MΩ·km	KV/5min.	kg/km
3C	16	7	1.46	45	1.143	40	1.016	45	1.14	40	1.02	11.6	12.5	4.61	14.34	3,048	5.5	210
	14	7	1.84	45	1.143	40	1.016	45	1.14	40	1.02	12.4	13.4	2.84	8.83	3,048	5.5	250
	12	7	2.31	45	1.143	40	1.016	60	1.52	50	1.27	14.3	15.4	1.79	5.87	3,048	5.5	340
	10	7	2.95	45	1.143	40	1.016	60	1.52	50	1.27	15.5	16.8	1.12	3.68	3,048	5.5	430
	9	7	3.30	45	1.143	40	1.016	60	1.52	50	1.27	16.3	17.6	0.891	2.913	3,048	5.5	500
	8	7	3.71	55	1.397	50	1.270	60	1.52	50	1.27	18.3	19.7	0.705	2.310	3,048	7.0	610
	7	7	4.17	55	1.397	50	1.270	60	1.52	50	1.27	19.2	20.8	0.560	1.831	3,048	7.0	710
	6	7	4.67	55	1.397	50	1.270	60	1.52	50	1.27	20.6	22.2	0.444	1.457	3,048	7.0	830
	5	7	5.23	55	1.397	50	1.270	80	2.03	70	1.78	22.8	24.6	0.352	1.155	3,048	7.0	1050
	4	7	5.89	55	1.397	50	1.270	80	2.03	70	1.78	24.1	26.1	0.280	0.918	3,048	7.0	1220
	3	7	6.60	55	1.397	50	1.270	80	2.03	70	1.78	25.7	27.0	0.222	0.727	3,048	7.0	1440
	2	7	7.42	55	1.397	50	1.270	80	2.03	70	1.78	27.4	28.8	0.176	0.576	3,048	7.0	1710
	1	19	8.43	65	1.651	60	1.524	80	2.03	70	1.78	30.8	32.3	0.139	0.458	3,048	8.0	2130
	1/0	19	9.47	65	1.651	60	1.524	80	2.03	70	1.78	32.9	34.6	0.1103	0.3621	3,048	8.0	2540
	2/0	19	10.64	65	1.651	60	1.524	80	2.03	70	1.78	35.5	37.3	0.0876	0.2872	3,048	8.0	3070
	3/0	19	11.94	65	1.651	60	1.524	80	2.03	70	1.78	38.3	40.2	0.0694	0.2278	3,048	8.0	3710
	4/0	19	13.41	65	1.651	60	1.524	80	2.03	70	1.78	41.4	43.5	0.0545	0.1789	3,048	8.0	4500
	250	37	14.61	75	1.905	70	1.778	110	2.79	95	2.41	46.8	49.1	0.0466	0.1529	3,048	9.5	5630
	300	37	16.00	75	1.905	70	1.778	110	2.79	95	2.41	49.8	52.3	0.0389	0.1280	3,048	9.5	6560
	350	37	17.30	75	1.905	70	1.778	110	2.79	95	2.41	53.3	56.0	0.0333	0.1092	3,048	9.5	7540
	400	37	18.49	75	1.905	70	1.778	110	2.79	95	2.41	55.9	58.7	0.0288	0.0946	3,048	9.5	8450
	500	37	20.65	75	1.905	70	1.778	110	2.79	95	2.41	60.6	63.6	0.0231	0.0757	3,048	9.5	10240
	750	61	25.35	90	2.286	85	2.159	140	3.56	120	3.05	74.1	77.8	0.0154	0.0505	3,048	11.5	15690
	1000	61	29.26	90	2.286	85	2.159	140	3.56	120	3.05	82.4	86.6	0.0115	0.0379	3,048	11.5	20160
4C	14	7	1.84	45	1.143	40	1.016	60	1.52	50	1.27	14.3	15.5	2.84	8.83	3,048	5.5	340
	12	7	2.31	45	1.143	40	1.016	60	1.52	50	1.27	15.5	16.7	1.79	5.87	3,048	5.5	410
	10	7	2.95	45	1.143	40	1.016	60	1.52	50	1.27	17.0	18.3	1.12	3.68	3,048	5.5	530
	9	7	3.30	45	1.143	40	1.016	60	1.52	50	1.27	17.8	19.2	0.891	2.913	3,048	5.5	610
	8	7	3.71	55	1.397	50	1.270	60	1.52	50	1.27	20.0	21.6	0.705	2.310	3,048	7.0	760
	7	7	4.17	55	1.397	50	1.270	60	1.52	50	1.27	21.1	22.8	0.560	1.831	3,048	7.0	880
	6	7	4.67	55	1.397	50	1.270	80	2.03	70	1.78	23.6	25.4	0.444	1.457	3,048	7.0	1120
	5	7	5.23	55	1.397	50	1.270	80	2.03	70	1.78	24.9	26.9	0.352	1.155	3,048	7.0	1310
	4	7	5.89	55	1.397	50	1.270	80	2.03	70	1.78	26.5	27.8	0.280	0.918	3,048	7.0	1530
	3	7	6.60	55	1.397	50	1.270	80	2.03	70	1.78	28.2	29.6	0.222	0.727	3,048	7.0	1820
	2	7	7.42	55	1.397	50	1.270	80	2.03	70	1.78	30.2	31.7	0.176	0.576	3,048	7.0	2170
	1	19	8.43	65	1.651	60	1.524	80	2.03	70	1.78	33.9	35.6	0.139	0.458	3,048	8.0	2710
	1/0	19	9.47	65	1.651	60	1.524	80	2.03	70	1.78	36.3	38.1	0.1103	0.3621	3,048	8.0	3230
	2/0	19	10.64	65	1.651	60	1.524	80	2.03	70	1.78	39.2	41.1	0.0876	0.2872	3,048	8.0	3920
	3/0	19	11.94	65	1.651	60	1.524	80	2.03	70	1.78	42.3	44.4	0.0694	0.2278	3,048	8.0	4750
	4/0	19	13.41	65	1.651	60	1.524	110	2.79	95	2.41	47.4	49.8	0.0545	0.1789	3,048	8.0	6110
	250	37	14.61	75	1.905	70	1.778	110	2.79	95	2.41	51.6	54.2	0.0466	0.1529	3,048	9.5	7200
	300	37	16.00	75	1.905	70	1.778	110	2.79	95	2.41	55.0	57.7	0.0389	0.1280	3,048	9.5	8410
	350	37	17.30	75	1.905	70	1.778	110	2.79	95	2.41	59.0	61.9	0.0333	0.1092	3,048	9.5	9680
	400	37	18.49	75	1.905	70	1.778	110	2.79	95	2.41	61.9	64.9	0.0288	0.0946	3,048	9.5	10870
	500	37	20.65	75	1.905	70	1.778	110	2.79	95	2.41	67.1	70.4	0.0231	0.0757	3,048	9.5	13200
	750	61	25.35	90	2.286	85	2.159	140	3.56	120	3.05	82.0	86.1	0.0154	0.0505	3,048	11.5	20210
	1000	61	29.26	90	2.286	85	2.159	140	3.56	120	3.05	91.4	95.9	0.0115	0.0379	3,048	11.5	26030



LV Control Cable



600V CONTROL EPR / FR-PO	20 ~ 22
600V CONTROL EPR / FR-PO-S	23 ~ 25
600V CONTROL EPR / FR-PO-CMS	26 ~ 28



Control Cable

600V CONTROL EPR/FR-PO

Application Standard

- Design guide : NEMA WC 57(ICEA S-73-532)(2004ed)
: ASTM B3(2001ed), B8(2004ed), B33(2004ed)
: 9-171-E243
- Flame test : IEEE 383(2003ed), IEEE 1202(1991ed), UL 1581(2001ed)

Operating Condition & Environmental Design Requirements

- Service Life : 60 years
- Temperature, °F : 50 ~ 122
- Relative Humidity, % : 5 ~ 90
- Radiation TID (Gy) : 1.5 x 10⁴
Total Integrated Dose (TID) for normal condition is a 60 year normal operation dose.

Aging test & Flame test

- Code & Standard : IEEE 383
- Aging test (Funtional) : 60 year aging test (Voltage withstand + Insulation resistance)
- Flame test : Unaged & Aged VTFT (IEEE 1202), VFT (UL 1581)
* Refer to Technical Information (Aging & Aged Flame Test Procedure)

Construction

Classification	Code	Construction detail
Conductor		- Tin-coated annealed copper conductor (Class B)
Insulation	EPR	- EPR (Class E-II)
Cabling		- Insulated cores shall be assembled - Filler, if uesd, shall be non-hygroscopic and flame-retardant - A binder tape may be used over the assembly
Jacket	FR-PO	- Flame retardant Poly-Olefin (FR-PO)
Identification of cores		- 2Cores : Black, White - 3Cores : Black, White, Red - Multi Core : Identified for Method 3 as per NEMA WC 57, Appendix E

600V CONTROL EPR/FR-PO

No. of Core	Conductor			Thickness of Insulation		Thickness of Jacket		Overall Diameter		Max. Conductor Resistance (at 25℃)		Insulation Resistance Constant (at 15.6℃)	Test Voltage	Cable Weight
	Nominal Area	Number of wire	Diameter of conductor	Minimum		Minimum		Approx.	Maximum					
No.	AWG/KCM	EA.	mm	mils	mm	mils	mm	mm	mm	Ω/1000ft	Ω/km	MΩ·km	KV/5min.	kg/km
2C	16	7	1.46	25	0.635	45	1.14	8.7	9.4	4.61	14.34	3,048	2.5	100
3C	16	7	1.46	25	0.635	45	1.14	9.2	9.9	4.61	14.34	3,048	2.5	130
4C	16	7	1.46	25	0.635	45	1.14	9.9	10.7	4.61	14.34	3,048	2.5	150
5C	16	7	1.46	25	0.635	45	1.14	10.8	11.6	4.61	14.34	3,048	2.5	180
6C	16	7	1.46	25	0.635	45	1.14	11.7	12.6	4.61	14.34	3,048	2.5	210
7C	16	7	1.46	25	0.635	45	1.14	11.7	12.6	4.61	14.34	3,048	2.5	230
8C	16	7	1.46	25	0.635	45	1.14	12.6	13.6	4.61	14.34	3,048	2.5	260
9C	16	7	1.46	25	0.635	60	1.52	14.3	15.4	4.61	14.34	3,048	2.5	320
10C	16	7	1.46	25	0.635	60	1.52	15.4	16.7	4.65	14.48	3,048	2.5	370
12C	16	7	1.46	25	0.635	60	1.52	15.9	17.2	4.65	14.48	3,048	2.5	410
14C	16	7	1.46	25	0.635	60	1.52	16.7	18.0	4.65	14.48	3,048	2.5	460
16C	16	7	1.46	25	0.635	60	1.52	17.5	18.9	4.65	14.48	3,048	2.5	510
19C	16	7	1.46	25	0.635	60	1.52	18.4	19.9	4.65	14.48	3,048	2.5	580
20C	16	7	1.46	25	0.635	60	1.52	18.9	20.4	4.65	14.48	3,048	2.5	610
24C	16	7	1.46	25	0.635	80	2.03	22.3	24.1	4.65	14.48	3,048	2.5	820
37C	16	7	1.46	25	0.635	80	2.03	25.3	27.3	4.65	14.48	3,048	2.5	1130
48C	16	7	1.46	25	0.635	80	2.03	28.7	30.2	4.65	14.48	3,048	2.5	1450
2C	14	7	1.84	30	0.762	45	1.14	9.9	10.7	2.84	8.83	3,048	3.0	140
3C	14	7	1.84	30	0.762	45	1.14	10.4	11.3	2.84	8.83	3,048	3.0	170
4C	14	7	1.84	30	0.762	45	1.14	11.4	12.3	2.84	8.83	3,048	3.0	210
5C	14	7	1.84	30	0.762	45	1.14	12.4	13.4	2.84	8.83	3,048	3.0	250
6C	14	7	1.84	30	0.762	60	1.52	14.2	15.4	2.84	8.83	3,048	3.0	330
7C	14	7	1.84	30	0.762	60	1.52	14.2	15.4	2.84	8.83	3,048	3.0	350
8C	14	7	1.84	30	0.762	60	1.52	15.3	16.5	2.84	8.83	3,048	3.0	400
9C	14	7	1.84	30	0.762	60	1.52	16.4	17.7	2.84	8.83	3,048	3.0	450
10C	14	7	1.84	30	0.762	60	1.52	17.8	19.2	2.87	8.92	3,048	3.0	510
12C	14	7	1.84	30	0.762	60	1.52	18.3	19.8	2.87	8.92	3,048	3.0	570
14C	14	7	1.84	30	0.762	60	1.52	19.3	20.8	2.87	8.92	3,048	3.0	640
16C	14	7	1.84	30	0.762	60	1.52	20.3	21.9	2.87	8.92	3,048	3.0	720
19C	14	7	1.84	30	0.762	80	2.03	22.3	24.1	2.87	8.92	3,048	3.0	890
20C	14	7	1.84	30	0.762	80	2.03	23.0	24.8	2.87	8.92	3,048	3.0	940
24C	14	7	1.84	30	0.762	80	2.03	25.9	27.2	2.87	8.92	3,048	3.0	1160
37C	14	7	1.84	30	0.762	80	2.03	29.4	30.9	2.87	8.92	3,048	3.0	1610
48C	14	7	1.84	30	0.762	80	2.03	33.5	35.2	2.87	8.92	3,048	3.0	2070

600V CONTROL EPR/FR-PO

No. of Core	Conductor			Thickness of Insulation		Thickness of Jacket		Overall Diameter		Max. Conductor Resistance (at 25°C)		Insulation Resistance Constant (at 15.6°C)	Test Voltage	Cable Weight
	Nominal Area	Number of wire	Diameter of conductor											
				Minimum		Minimum		Approx.	Maximum					
No.	AWG/KCM	EA.	mm	mils	mm	mils	mm	mm	mm	Ω/1000ft	Ω/km	MΩ-km	KV/5min.	kg/km
2C	12	7	2.31	30	0.762	45	1.14	10.8	11.7	1.79	5.87	3,048	3.0	180
3C	12	7	2.31	30	0.762	45	1.14	11.5	12.4	1.79	5.87	3,048	3.0	220
4C	12	7	2.31	30	0.762	45	1.14	12.5	13.5	1.79	5.87	3,048	3.0	280
5C	12	7	2.31	30	0.762	60	1.52	14.5	15.6	1.79	5.87	3,048	3.0	370
6C	12	7	2.31	30	0.762	60	1.52	15.7	16.9	1.79	5.87	3,048	3.0	430
7C	12	7	2.31	30	0.762	60	1.52	15.7	16.9	1.79	5.87	3,048	3.0	460
8C	12	7	2.31	30	0.762	60	1.52	16.9	18.3	1.79	5.87	3,048	3.0	530
9C	12	7	2.31	30	0.762	60	1.52	18.1	19.6	1.79	5.87	3,048	3.0	600
10C	12	7	2.31	30	0.762	60	1.52	19.7	21.3	1.81	5.93	3,048	3.0	680
12C	12	7	2.31	30	0.762	60	1.52	20.3	21.9	1.81	5.93	3,048	3.0	770
14C	12	7	2.31	30	0.762	80	2.03	22.4	24.2	1.81	5.93	3,048	3.0	940
16C	12	7	2.31	30	0.762	80	2.03	23.5	25.4	1.81	5.93	3,048	3.0	1060
19C	12	7	2.31	30	0.762	80	2.03	24.7	26.7	1.81	5.93	3,048	3.0	1210
20C	12	7	2.31	30	0.762	80	2.03	25.5	27.5	1.81	5.93	3,048	3.0	1270
24C	12	7	2.31	30	0.762	80	2.03	28.8	30.2	1.81	5.93	3,048	3.0	1560
37C	12	7	2.31	30	0.762	80	2.03	32.8	34.4	1.81	5.93	3,048	3.0	2200
48C	12	7	2.31	30	0.762	80	2.03	37.4	39.3	1.81	5.93	3,048	3.0	2840
2C	10	7	2.95	30	0.762	45	1.14	12.0	13.0	1.12	3.68	3,048	3.0	240
3C	10	7	2.95	30	0.762	45	1.14	12.8	13.8	1.12	3.68	3,048	3.0	300
4C	10	7	2.95	30	0.762	60	1.52	14.8	15.9	1.12	3.68	3,048	3.0	410
5C	10	7	2.95	30	0.762	60	1.52	16.1	17.4	1.12	3.68	3,048	3.0	500
6C	10	7	2.95	30	0.762	60	1.52	17.5	18.9	1.12	3.68	3,048	3.0	590
7C	10	7	2.95	30	0.762	60	1.52	17.5	18.9	1.12	3.68	3,048	3.0	640
8C	10	7	2.95	30	0.762	60	1.52	18.9	20.4	1.12	3.68	3,048	3.0	730
9C	10	7	2.95	30	0.762	60	1.52	20.3	21.9	1.12	3.68	3,048	3.0	830
10C	10	7	2.95	30	0.762	80	2.03	23.1	24.9	1.13	3.72	3,048	3.0	1020
12C	10	7	2.95	30	0.762	80	2.03	23.8	25.7	1.13	3.72	3,048	3.0	1150
14C	10	7	2.95	30	0.762	80	2.03	25.0	27.0	1.13	3.72	3,048	3.0	1300
16C	10	7	2.95	30	0.762	80	2.03	26.4	27.7	1.13	3.72	3,048	3.0	1460
19C	10	7	2.95	30	0.762	80	2.03	27.7	29.1	1.13	3.72	3,048	3.0	1680
20C	10	7	2.95	30	0.762	80	2.03	28.6	30.0	1.13	3.72	3,048	3.0	1770
24C	10	7	2.95	30	0.762	80	2.03	32.4	34.0	1.13	3.72	3,048	3.0	2170
37C	10	7	2.95	30	0.762	80	2.03	37.0	38.8	1.13	3.72	3,048	3.0	3100
48C	10	7	2.95	30	0.762	80	2.03	42.3	44.5	1.13	3.72	3,048	3.0	4020



600V CONTROL EPR/FR-PO-S

Application Standard

- | | |
|----------------|--|
| - Design guide | : NEMA WC 57(ICEA S-73-532)(2004ed) |
| | : ASTM B3(2001ed), B8(2004ed), B33(2004ed) |
| | : 9-171-E243 |
| - Flame test | : IEEE 383(2003ed), IEEE 1202(1991ed), UL 1581(2001ed) |

Operating Condition & Environmental Design Requirements

- Service Life : 60 years
 - Temperature, °F : 50 ~ 122
 - Relative Humidity, % : 5 ~ 90
 - Radiation TID (Gy) : 1.5×10^4
- Total Integrated Dose (TID) for normal condition is a 60 year normal operation dose.

Aging test & Flame test

- Code & Standard : IEEE 383
- Aging test (Functional) : 60 year aging test (Voltage withstand + Insulation resistance)
- Flame test : Unaged & Aged VTFT (IEEE 1202), VFT (UL 1581)
- * Refer to Technical Information (Aging & Aged Flame Test Procedure)

Construction

Classification	Code	Construction detail
Conductor		- Tin-coated annealed copper conductor (Class B)
Insulation	EPR	- EPR (Class E-II)
Cabling		- Insulated cores shall be assembled - Filler, if used, shall be non-hygroscopic and flame-retardant - A binder tape may be used over the assembly
Shield	- S	- Tin-coated copper tape - A suitable tape may be applied over the shield
Jacket	FR-PO	- Flame retardant Poly-Olefin (FR-PO)
Identification of cores		- 2Cores : Black, White - 3Cores : Black, White, Red - Multi Core : Identified for Method 3 as per NEMA WC 57, Appendix E

Control Cable

600V CONTROL EPR/FR-PO-S

No. of Core	Nominal Area	Conductor		Thickness of Insulation		Thickness of Jacket		Overall Diameter		Max. Conductor Resistance (at 25°C)		Insulation Resistance Constant (at 15.6°C)	Test Voltage	Cable Weight
		Number of wire	Diameter of conductor	Minimum		Minimum		Approx.	Maximum					
				EA	mm	mils	mm			mils	mm	mm	mm	Ω/1000ft
2C	16	7	1.46	25	0.635	45	1.14	9.3	10.0	4.61	14.34	3,048	2.5	140
3C	16	7	1.46	25	0.635	45	1.14	9.7	10.5	4.61	14.34	3,048	2.5	160
4C	16	7	1.46	25	0.635	45	1.14	10.5	11.3	4.61	14.34	3,048	2.5	190
5C	16	7	1.46	25	0.635	45	1.14	11.3	12.2	4.61	14.34	3,048	2.5	220
6C	16	7	1.46	25	0.635	45	1.14	12.2	13.2	4.61	14.34	3,048	2.5	260
7C	16	7	1.46	25	0.635	45	1.14	12.2	13.2	4.61	14.34	3,048	2.5	270
8C	16	7	1.46	25	0.635	45	1.14	13.1	14.2	4.61	14.34	3,048	2.5	310
9C	16	7	1.46	25	0.635	60	1.52	14.8	16.0	4.61	14.34	3,048	2.5	380
10C	16	7	1.46	25	0.635	60	1.52	16.0	17.2	4.65	14.48	3,048	2.5	430
12C	16	7	1.46	25	0.635	60	1.52	16.4	17.7	4.65	14.48	3,048	2.5	470
14C	16	7	1.46	25	0.635	60	1.52	17.2	18.6	4.65	14.48	3,048	2.5	530
16C	16	7	1.46	25	0.635	60	1.52	18.0	19.5	4.65	14.48	3,048	2.5	580
19C	16	7	1.46	25	0.635	60	1.52	18.9	20.4	4.65	14.48	3,048	2.5	660
20C	16	7	1.46	25	0.635	60	1.52	19.5	21.0	4.65	14.48	3,048	2.5	690
24C	16	7	1.46	25	0.635	80	2.03	22.9	24.7	4.65	14.48	3,048	2.5	920
37C	16	7	1.46	25	0.635	80	2.03	25.9	27.1	4.65	14.48	3,048	2.5	1240
48C	16	7	1.46	25	0.635	80	2.03	29.3	30.7	4.65	14.48	3,048	2.5	1570
2C	14	7	1.84	30	0.762	45	1.14	10.4	11.3	2.84	8.83	3,048	3.0	180
3C	14	7	1.84	30	0.762	45	1.14	11.0	11.9	2.84	8.83	3,048	3.0	210
4C	14	7	1.84	30	0.762	45	1.14	11.9	12.9	2.84	8.83	3,048	3.0	250
5C	14	7	1.84	30	0.762	45	1.14	12.9	14.0	2.84	8.83	3,048	3.0	300
6C	14	7	1.84	30	0.762	60	1.52	14.8	16.0	2.84	8.83	3,048	3.0	380
7C	14	7	1.84	30	0.762	60	1.52	14.8	16.0	2.84	8.83	3,048	3.0	410
8C	14	7	1.84	30	0.762	60	1.52	15.9	17.1	2.84	8.83	3,048	3.0	460
9C	14	7	1.84	30	0.762	60	1.52	17.0	18.3	2.84	8.83	3,048	3.0	520
10C	14	7	1.84	30	0.762	60	1.52	18.3	19.8	2.87	8.92	3,048	3.0	590
12C	14	7	1.84	30	0.762	60	1.52	18.9	20.4	2.87	8.92	3,048	3.0	650
14C	14	7	1.84	30	0.762	60	1.52	19.8	21.4	2.87	8.92	3,048	3.0	720
16C	14	7	1.84	30	0.762	60	1.52	20.8	22.5	2.87	8.92	3,048	3.0	810
19C	14	7	1.84	30	0.762	80	2.03	22.9	24.7	2.87	8.92	3,048	3.0	990
20C	14	7	1.84	30	0.762	80	2.03	23.5	25.4	2.87	8.92	3,048	3.0	1040
24C	14	7	1.84	30	0.762	80	2.03	26.4	27.8	2.87	8.92	3,048	3.0	1270
37C	14	7	1.84	30	0.762	80	2.03	30.0	31.5	2.87	8.92	3,048	3.0	1740
48C	14	7	1.84	30	0.762	80	2.03	34.1	35.8	2.87	8.92	3,048	3.0	2220

600V CONTROL EPR/FR-PO-S

No. of Core	Conductor			Thickness of Insulation		Thickness of Jacket		Overall Diameter		Max. Conductor Resistance (at 25°C)		Insulation Resistance Constant (at 15.6°C)	Test Voltage	Cable Weight
	Nominal Area	Number of wire	Diameter of conductor					Approx.						
				Minimum	Minimum	mm	mm							
No.	AWG/KCM	EA	mm	mils	mm	mils	mm	mm	mm	Ω/1000ft	Ω/km	MΩ-km	kV/5min.	kg/km
2C	12	7	2.31	30	0.762	45	1.14	11.4	12.3	1.79	5.87	3,048	3.0	220
3C	12	7	2.31	30	0.762	45	1.14	12.0	13.0	1.79	5.87	3,048	3.0	270
4C	12	7	2.31	30	0.762	45	1.14	13.1	14.1	1.79	5.87	3,048	3.0	330
5C	12	7	2.31	30	0.762	60	1.52	15.0	16.2	1.79	5.87	3,048	3.0	420
6C	12	7	2.31	30	0.762	60	1.52	16.2	17.5	1.79	5.87	3,048	3.0	490
7C	12	7	2.31	30	0.762	60	1.52	16.2	17.5	1.79	5.87	3,048	3.0	530
8C	12	7	2.31	30	0.762	60	1.52	17.5	18.8	1.79	5.87	3,048	3.0	600
9C	12	7	2.31	30	0.762	60	1.52	18.7	20.2	1.79	5.87	3,048	3.0	680
10C	12	7	2.31	30	0.762	60	1.52	20.3	21.9	1.81	5.93	3,048	3.0	770
12C	12	7	2.31	30	0.762	60	1.52	20.9	22.5	1.81	5.93	3,048	3.0	850
14C	12	7	2.31	30	0.762	80	2.03	22.9	24.8	1.81	5.93	3,048	3.0	1040
16C	12	7	2.31	30	0.762	80	2.03	24.1	26.0	1.81	5.93	3,048	3.0	1160
19C	12	7	2.31	30	0.762	80	2.03	25.3	27.3	1.81	5.93	3,048	3.0	1310
20C	12	7	2.31	30	0.762	80	2.03	26.0	27.3	1.81	5.93	3,048	3.0	1380
24C	12	7	2.31	30	0.762	80	2.03	29.3	30.8	1.81	5.93	3,048	3.0	1690
37C	12	7	2.31	30	0.762	80	2.03	33.3	35.0	1.81	5.93	3,048	3.0	2340
48C	12	7	2.31	30	0.762	80	2.03	38.0	39.9	1.81	5.93	3,048	3.0	3010
2C	10	7	2.95	30	0.762	45	1.14	12.6	13.6	1.12	3.68	3,048	3.0	290
3C	10	7	2.95	30	0.762	45	1.14	13.3	14.4	1.12	3.68	3,048	3.0	350
4C	10	7	2.95	30	0.762	60	1.52	15.3	16.5	1.12	3.68	3,048	3.0	470
5C	10	7	2.95	30	0.762	60	1.52	16.6	18.0	1.12	3.68	3,048	3.0	560
6C	10	7	2.95	30	0.762	60	1.52	18.0	19.5	1.12	3.68	3,048	3.0	660
7C	10	7	2.95	30	0.762	60	1.52	18.0	19.5	1.12	3.68	3,048	3.0	710
8C	10	7	2.95	30	0.762	60	1.52	19.4	21.0	1.12	3.68	3,048	3.0	810
9C	10	7	2.95	30	0.762	60	1.52	20.9	22.5	1.12	3.68	3,048	3.0	910
10C	10	7	2.95	30	0.762	80	2.03	23.7	25.5	1.13	3.72	3,048	3.0	1120
12C	10	7	2.95	30	0.762	80	2.03	24.4	26.3	1.13	3.72	3,048	3.0	1250
14C	10	7	2.95	30	0.762	80	2.03	25.6	26.8	1.13	3.72	3,048	3.0	1410
16C	10	7	2.95	30	0.762	80	2.03	26.9	28.2	1.13	3.72	3,048	3.0	1570
19C	10	7	2.95	30	0.762	80	2.03	28.3	29.7	1.13	3.72	3,048	3.0	1800
20C	10	7	2.95	30	0.762	80	2.03	29.1	30.6	1.13	3.72	3,048	3.0	1890
24C	10	7	2.95	30	0.762	80	2.03	32.9	34.6	1.13	3.72	3,048	3.0	2310
37C	10	7	2.95	30	0.762	80	2.03	37.5	39.4	1.13	3.72	3,048	3.0	3260
48C	10	7	2.95	30	0.762	110	2.79	44.5	46.7	1.13	3.72	3,048	3.0	4510

Control Cable

600V CONTROL EPR/FR-PO-CMS

Application Standard

- Design guide : NEMA WC 57(ICEA S-73-532)(2004ed)
: ASTM B3(2001ed), B8(2004ed), B33(2004ed)
: 9-171-E243
- Flame test : IEEE 383(2003ed), IEEE 1202(1991ed), UL 1581(2001ed)

Operating Condition & Environmental Design Requirements

- Service Life : 60 years
- Temperature, °F : 50 ~ 122
- Relative Humidity, % : 5 ~ 90
- Radiation TID (Gy) : 1.5 x 10⁴
Total Integrated Dose (TID) for normal condition is a 60 year normal operation dose.

Aging test & Flame test

- Code & Standard : IEEE 383
- Aging test (Funtional) : 60 year aging test (Voltage withstand + Insulation resistance)
- Flame test : Unaged & Aged VTFT (IEEE 1202), VFT (UL 1581)
* Refer to Technical Information (Aging & Aged Flame Test Procedure)

Construction

Classification	Code	Construction detail
Conductor		- Tin-coated annealed copper conductor (Class B)
Insulation	EPR	- EPR (Class E-II)
Cabling		- Insulated cores shall be assembled - Filler, if uesd, shall be non-hygroscopic and flame-retardant - A binder tape may be used over the assembly
Shield	- CMS	- Shielded by Copper Mylar tape(CU/PS) with tinned copper drain wire - A suitable tape may be applied over the shield
Jacket	FR-PO	- Flame retardant Poly-Olefin (FR-PO)
Identification of cores		- 2Cores : Black, White - 3Cores : Black, White, Red - Multi Core : Identified for Method 3 as per NEMA WC 57, Appendix E

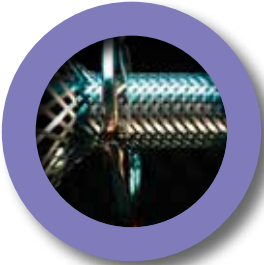
600V CONTROL EPR/FR-PO-CMS

No. of Core	Conductor			Thickness of Insulation		Thickness of Jacket		Overall Diameter		Max. Conductor Resistance (at 25℃)		Insulation Resistance Constant (at 15.6℃)	Test Voltage	Cable Weight
	Nominal Area	Number of wire	Diameter of conductor	Minimum		Minimum		Approx.	Maximum					
No.	AWG/KCM	EA	mm	mils	mm	mils	mm	mm	mm	Ω/1000ft	Ω/km	MΩ-km	KV/5min.	kg/km
2C	16	7	1.46	25	0.635	45	1.14	8.8	9.5	4.61	14.34	3,048	2.5	120
3C	16	7	1.46	25	0.635	45	1.14	9.2	10.0	4.61	14.34	3,048	2.5	140
4C	16	7	1.46	25	0.635	45	1.14	10.0	10.8	4.61	14.34	3,048	2.5	170
5C	16	7	1.46	25	0.635	45	1.14	10.8	11.7	4.61	14.34	3,048	2.5	200
6C	16	7	1.46	25	0.635	45	1.14	11.7	12.7	4.61	14.34	3,048	2.5	230
7C	16	7	1.46	25	0.635	45	1.14	11.7	12.7	4.61	14.34	3,048	2.5	240
8C	16	7	1.46	25	0.635	45	1.14	12.6	13.6	4.61	14.34	3,048	2.5	280
9C	16	7	1.46	25	0.635	60	1.52	14.3	15.5	4.61	14.34	3,048	2.5	340
10C	16	7	1.46	25	0.635	60	1.52	15.5	16.7	4.65	14.48	3,048	2.5	390
12C	16	7	1.46	25	0.635	60	1.52	15.9	17.2	4.65	14.48	3,048	2.5	430
14C	16	7	1.46	25	0.635	60	1.52	16.7	18.0	4.65	14.48	3,048	2.5	480
16C	16	7	1.46	25	0.635	60	1.52	17.6	19.0	4.65	14.48	3,048	2.5	530
19C	16	7	1.46	25	0.635	60	1.52	18.4	19.9	4.65	14.48	3,048	2.5	600
20C	16	7	1.46	25	0.635	60	1.52	19.0	20.5	4.65	14.48	3,048	2.5	640
24C	16	7	1.46	25	0.635	80	2.03	22.4	24.2	4.65	14.48	3,048	2.5	850
37C	16	7	1.46	25	0.635	80	2.03	25.4	27.4	4.65	14.48	3,048	2.5	1160
48C	16	7	1.46	25	0.635	80	2.03	28.8	30.2	4.65	14.48	3,048	2.5	1480
2C	14	7	1.84	30	0.762	45	1.14	9.9	10.7	2.84	8.83	3,048	3.0	160
3C	14	7	1.84	30	0.762	45	1.14	10.5	11.3	2.84	8.83	3,048	3.0	190
4C	14	7	1.84	30	0.762	45	1.14	11.4	12.3	2.84	8.83	3,048	3.0	230
5C	14	7	1.84	30	0.762	45	1.14	12.4	13.4	2.84	8.83	3,048	3.0	270
6C	14	7	1.84	30	0.762	60	1.52	14.3	15.4	2.84	8.83	3,048	3.0	350
7C	14	7	1.84	30	0.762	60	1.52	14.3	15.4	2.84	8.83	3,048	3.0	370
8C	14	7	1.84	30	0.762	60	1.52	15.4	16.6	2.84	8.83	3,048	3.0	420
9C	14	7	1.84	30	0.762	60	1.52	16.5	17.8	2.84	8.83	3,048	3.0	470
10C	14	7	1.84	30	0.762	60	1.52	17.8	19.3	2.87	8.92	3,048	3.0	540
12C	14	7	1.84	30	0.762	60	1.52	18.4	19.9	2.87	8.92	3,048	3.0	600
14C	14	7	1.84	30	0.762	60	1.52	19.3	20.9	2.87	8.92	3,048	3.0	670
16C	14	7	1.84	30	0.762	60	1.52	20.3	22.0	2.87	8.92	3,048	3.0	750
19C	14	7	1.84	30	0.762	80	2.03	22.4	24.2	2.87	8.92	3,048	3.0	920
20C	14	7	1.84	30	0.762	80	2.03	23.0	24.9	2.87	8.92	3,048	3.0	970
24C	14	7	1.84	30	0.762	80	2.03	25.9	27.2	2.87	8.92	3,048	3.0	1190
37C	14	7	1.84	30	0.762	80	2.03	29.5	31.0	2.87	8.92	3,048	3.0	1650
48C	14	7	1.84	30	0.762	80	2.03	33.6	35.3	2.87	8.92	3,048	3.0	2110

Control Cable

600V CONTROL EPR/FR-PO-CMS

No. of Core	Conductor			Thickness of Insulation		Thickness of Jacket		Overall Diameter		Max. Conductor Resistance (at 25°C)		Insulation Resistance Constant (at 15.6°C)	Test Voltage	Cable Weight
	Nominal Area	Number of wire	Diameter of conductor	Minimum		Minimum		Approx.	Maximum					
No.	AWG/KCM	EA	mm	mils	mm	mils	mm	mm	mm	Ω/1000ft	Ω/km	MΩ-km	KV/5min.	kg/km
2C	12	7	2.31	30	0.762	45	1.14	10.9	11.8	1.79	5.87	3,048	3.0	200
3C	12	7	2.31	30	0.762	45	1.14	11.5	12.4	1.79	5.87	3,048	3.0	240
4C	12	7	2.31	30	0.762	45	1.14	12.6	13.6	1.79	5.87	3,048	3.0	290
5C	12	7	2.31	30	0.762	60	1.52	14.5	15.7	1.79	5.87	3,048	3.0	390
6C	12	7	2.31	30	0.762	60	1.52	15.7	17.0	1.79	5.87	3,048	3.0	450
7C	12	7	2.31	30	0.762	60	1.52	15.7	17.0	1.79	5.87	3,048	3.0	480
8C	12	7	2.31	30	0.762	60	1.52	17.0	18.3	1.79	5.87	3,048	3.0	550
9C	12	7	2.31	30	0.762	60	1.52	18.2	19.7	1.79	5.87	3,048	3.0	620
10C	12	7	2.31	30	0.762	60	1.52	19.8	21.3	1.81	5.93	3,048	3.0	710
12C	12	7	2.31	30	0.762	60	1.52	20.4	22.0	1.81	5.93	3,048	3.0	800
14C	12	7	2.31	30	0.762	80	2.03	22.4	24.2	1.81	5.93	3,048	3.0	970
16C	12	7	2.31	30	0.762	80	2.03	23.6	25.5	1.81	5.93	3,048	3.0	1090
19C	12	7	2.31	30	0.762	80	2.03	24.8	26.8	1.81	5.93	3,048	3.0	1240
20C	12	7	2.31	30	0.762	80	2.03	25.5	26.8	1.81	5.93	3,048	3.0	1300
24C	12	7	2.31	30	0.762	80	2.03	28.8	30.3	1.81	5.93	3,048	3.0	1600
37C	12	7	2.31	30	0.762	80	2.03	32.9	34.5	1.81	5.93	3,048	3.0	2240
48C	12	7	2.31	30	0.762	80	2.03	37.5	39.4	1.81	5.93	3,048	3.0	2890
2C	10	7	2.95	30	0.762	45	1.14	12.1	13.1	1.12	3.68	3,048	3.0	250
3C	10	7	2.95	30	0.762	45	1.14	12.8	13.8	1.12	3.68	3,048	3.0	320
4C	10	7	2.95	30	0.762	60	1.52	14.8	16.0	1.12	3.68	3,048	3.0	430
5C	10	7	2.95	30	0.762	60	1.52	16.1	17.4	1.12	3.68	3,048	3.0	520
6C	10	7	2.95	30	0.762	60	1.52	17.5	18.9	1.12	3.68	3,048	3.0	610
7C	10	7	2.95	30	0.762	60	1.52	17.5	18.9	1.12	3.68	3,048	3.0	660
8C	10	7	2.95	30	0.762	60	1.52	18.9	20.5	1.12	3.68	3,048	3.0	760
9C	10	7	2.95	30	0.762	60	1.52	20.4	22.0	1.12	3.68	3,048	3.0	860
10C	10	7	2.95	30	0.762	80	2.03	23.2	25.0	1.13	3.72	3,048	3.0	1050
12C	10	7	2.95	30	0.762	80	2.03	23.9	25.8	1.13	3.72	3,048	3.0	1180
14C	10	7	2.95	30	0.762	80	2.03	25.1	27.1	1.13	3.72	3,048	3.0	1330
16C	10	7	2.95	30	0.762	80	2.03	26.4	27.7	1.13	3.72	3,048	3.0	1490
19C	10	7	2.95	30	0.762	80	2.03	27.8	29.2	1.13	3.72	3,048	3.0	1710
20C	10	7	2.95	30	0.762	80	2.03	28.6	30.1	1.13	3.72	3,048	3.0	1800
24C	10	7	2.95	30	0.762	80	2.03	32.4	34.0	1.13	3.72	3,048	3.0	2210
37C	10	7	2.95	30	0.762	80	2.03	37.1	38.9	1.13	3.72	3,048	3.0	3150
48C	10	7	2.95	30	0.762	80	2.03	42.4	44.5	1.13	3.72	3,048	3.0	4070



LV Instrumentation Cable



600V INSTRUMENTATION EPR/FR-PO-CMS 30 ~ 32



LV Instrumentation Cable

600V INSTRUMENTATION EPR/FR-PO-CMS

Application Standard

- Design guide : NEMA WC 57(ICEA S-73-532)(2004ed)
: ASTM B3(2001ed), B8(2004ed), B33(2004ed)
: 9-171-E243
- Flame test : IEEE 383(2003ed), IEEE 1202(1991ed), UL 1581(2001ed)

Operating Condition & Environmental Design Requirements

- Service Life : 60 years
- Temperature, °F : 50 ~ 122
- Relative Humidity, % : 5 ~ 90
- Radiation TID (Gy) : 1.5 x 10⁴
Total Integrated Dose (TID) for normal condition is a 60 year normal operation dose.

Aging test & Flame test

- Code & Standard : IEEE 383
 - Aging test (Funtional) : 60 year aging test (Voltage withstand + Insulation resistance)
 - Flame test : Unaged & Aged VTFT (IEEE 1202), VFT (UL 1581)
- * Refer to Technical Information (Aging & Aged Flame Test Procedure)

Construction

Classification	Code	Construction detail
Conductor		- Tin-coated annealed copper conductor (Class B)
Insulation	EPR	- EPR (Class E-II)
Twisting		- Two/Three Insulated cores shall be twisted together to form a pair/triad
Cabling		- Twisted pairs/triads shall be assembled - Filler, if uesd, shall be non-hygroscopic and flame-retardant - A binder tape may be used over the assembly
Shield	- CMS	- Shielded by Copper Mylar tape(CU/PS) with tinned copper drain wire - A suitable tape may be applied over the shield
Jacket	FR-PO	- Flame retardant Poly-Olefin (FR-PO)
Identification of cores		- Colored insulation plus Arabic number printing on the insulation Pair : Black, White Triad : Black, White, Red



600V INSTRUMENTATION EPR/FR-PO-CMS

No. of Pair	Conductor			Thickness of Insulation		Thickness of Jacket		Overall Diameter		Max. Conductor Resistance (at 25℃)		Insulation Resistance Constant (at 15.6℃)	Test Voltage	Cable Weight
	Nominal Area	Number of wire	Diameter of conductor	Minimum		Minimum		Approx.	Maximum					
No.	AWG/KCM	EA	mm	mils	mm	mils	mm	mm	mm	Ω/1000ft	Ω/km	MΩ-km	KV/5min.	kg/km
1P	16	7	1.46	25	0.635	45	1.14	8.8	9.5	4.70	14.62	3,048	2.5	120
2P	16	7	1.46	25	0.635	45	1.14	12.9	13.9	4.70	14.62	3,048	2.5	230
3P	16	7	1.46	25	0.635	60	1.52	14.6	15.8	4.70	14.62	3,048	2.5	310
4P	16	7	1.46	25	0.635	60	1.52	15.5	16.7	4.70	14.62	3,048	2.5	370
5P	16	7	1.46	25	0.635	60	1.52	17.3	18.6	4.70	14.62	3,048	2.5	450
6P	16	7	1.46	25	0.635	60	1.52	18.4	19.9	4.70	14.62	3,048	2.5	520
7P	16	7	1.46	25	0.635	60	1.52	18.4	19.9	4.70	14.62	3,048	2.5	540
8P	16	7	1.46	25	0.635	60	1.52	19.6	21.2	4.70	14.62	3,048	2.5	610
9P	16	7	1.46	25	0.635	60	1.52	20.8	22.5	4.70	14.62	3,048	2.5	690
10P	16	7	1.46	25	0.635	80	2.03	23.0	24.8	4.74	14.76	3,048	2.5	830
12P	16	7	1.46	25	0.635	80	2.03	23.9	25.8	4.74	14.76	3,048	2.5	930
14P	16	7	1.46	25	0.635	80	2.03	24.8	26.8	4.74	14.76	3,048	2.5	1030
16P	16	7	1.46	25	0.635	80	2.03	26.5	27.9	4.74	14.76	3,048	2.5	1170
20P	16	7	1.46	25	0.635	80	2.03	28.3	29.7	4.74	14.76	3,048	2.5	1380
24P	16	7	1.46	25	0.635	80	2.03	31.3	32.8	4.74	14.76	3,048	2.5	1650
30P	16	7	1.46	25	0.635	80	2.03	34.8	36.6	4.74	14.76	3,048	2.5	2040
48P	16	7	1.46	25	0.635	110	2.79	44.1	46.3	4.74	14.76	3,048	2.5	3390
1P	18	7	1.16	25	0.635	45	1.14	8.2	8.8	7.50	23.33	3,048	2.5	100
2P	18	7	1.16	25	0.635	45	1.14	11.9	12.8	7.50	23.33	3,048	2.5	190
3P	18	7	1.16	25	0.635	45	1.14	12.7	13.7	7.50	23.33	3,048	2.5	230
4P	18	7	1.16	25	0.635	60	1.52	14.3	15.4	7.50	23.33	3,048	2.5	300
5P	18	7	1.16	25	0.635	60	1.52	15.9	17.2	7.50	23.33	3,048	2.5	360
6P	18	7	1.16	25	0.635	60	1.52	16.9	18.3	7.50	23.33	3,048	2.5	410
7P	18	7	1.16	25	0.635	60	1.52	16.9	18.3	7.50	23.33	3,048	2.5	430
8P	18	7	1.16	25	0.635	60	1.52	18.0	19.4	7.50	23.33	3,048	2.5	480
9P	18	7	1.16	25	0.635	60	1.52	19.1	20.6	7.50	23.33	3,048	2.5	540
10P	18	7	1.16	25	0.635	60	1.52	20.1	21.7	7.57	23.55	3,048	2.5	590
12P	18	7	1.16	25	0.635	60	1.52	20.9	22.6	7.57	23.55	3,048	2.5	660
14P	18	7	1.16	25	0.635	80	2.03	22.7	24.5	7.57	23.55	3,048	2.5	810
16P	18	7	1.16	25	0.635	80	2.03	24.3	26.3	7.57	23.55	3,048	2.5	910
20P	18	7	1.16	25	0.635	80	2.03	25.9	27.2	7.57	23.55	3,048	2.5	1070
24P	18	7	1.16	25	0.635	80	2.03	28.6	30.0	7.57	23.55	3,048	2.5	1280
30P	18	7	1.16	25	0.635	80	2.03	31.8	33.4	7.57	23.55	3,048	2.5	1570
48P	18	7	1.16	25	0.635	80	2.03	38.7	40.6	7.57	23.55	3,048	2.5	2350

LV Instrumentation Cable

600V INSTRUMENTATION EPR/FR-PO-CMS

No. of Triad	Conductor			Thickness of Insulation		Thickness of Jacket		Overall Diameter		Max. Conductor Resistance (at 25°C)		Insulation Resistance Constant (at 15.6°C)	Test Voltage	Cable Weight
	Nominal Area	Number of wire	Diameter of conductor	Minimum		Minimum		Approx.	Maximum					
No.	AWG/KCM	EA	mm	mils	mm	mils	mm	mm	mm	Ω/1000ft	Ω/km	MΩ-km	KV/5min.	kg/km
1T	16	7	1.46	25	0.635	45	1.14	9.2	10.0	4.70	14.62	3,048	2.5	140
2T	16	7	1.46	25	0.635	60	1.52	14.9	16.1	4.70	14.62	3,048	2.5	320
3T	16	7	1.46	25	0.635	60	1.52	15.8	17.0	4.70	14.62	3,048	2.5	390
4T	16	7	1.46	25	0.635	60	1.52	17.3	18.6	4.70	14.62	3,048	2.5	480
5T	16	7	1.46	25	0.635	60	1.52	19.0	20.6	4.70	14.62	3,048	2.5	580
6T	16	7	1.46	25	0.635	80	2.03	22.4	24.2	4.70	14.62	3,048	2.5	780
7T	16	7	1.46	25	0.635	80	2.03	22.4	24.2	4.70	14.62	3,048	2.5	820
8T	16	7	1.46	25	0.635	80	2.03	23.9	25.8	4.70	14.62	3,048	2.5	930
9T	16	7	1.46	25	0.635	80	2.03	25.4	27.4	4.70	14.62	3,048	2.5	1040
10T	16	7	1.46	25	0.635	80	2.03	26.8	28.2	4.74	14.76	3,048	2.5	1160
12T	16	7	1.46	25	0.635	80	2.03	28.3	29.7	4.74	14.76	3,048	2.5	1320
14T	16	7	1.46	25	0.635	80	2.03	29.5	31.0	4.74	14.76	3,048	2.5	1470
16T	16	7	1.46	25	0.635	80	2.03	31.3	32.8	4.74	14.76	3,048	2.5	1650
20T	16	7	1.46	25	0.635	80	2.03	34.2	36.0	4.74	14.76	3,048	2.5	2000
24T	16	7	1.46	25	0.635	80	2.03	37.2	39.1	4.74	14.76	3,048	2.5	2360
30T	16	7	1.46	25	0.635	80	2.03	41.1	43.1	4.74	14.76	3,048	2.5	2890
1T	18	7	1.16	25	0.635	45	1.14	8.6	9.3	7.50	23.33	3,048	2.5	120
2T	18	7	1.16	25	0.635	45	1.14	13.0	14.0	7.50	23.33	3,048	2.5	230
3T	18	7	1.16	25	0.635	60	1.52	14.6	15.7	7.50	23.33	3,048	2.5	310
4T	18	7	1.16	25	0.635	60	1.52	15.9	17.2	7.50	23.33	3,048	2.5	380
5T	18	7	1.16	25	0.635	60	1.52	17.5	18.9	7.50	23.33	3,048	2.5	460
6T	18	7	1.16	25	0.635	60	1.52	19.6	21.2	7.50	23.33	3,048	2.5	560
7T	18	7	1.16	25	0.635	60	1.52	19.6	21.2	7.50	23.33	3,048	2.5	590
8T	18	7	1.16	25	0.635	60	1.52	20.9	22.6	7.50	23.33	3,048	2.5	660
9T	18	7	1.16	25	0.635	80	2.03	23.3	25.1	7.50	23.33	3,048	2.5	820
10T	18	7	1.16	25	0.635	80	2.03	24.6	26.6	7.57	23.55	3,048	2.5	910
12T	18	7	1.16	25	0.635	80	2.03	25.9	27.2	7.57	23.55	3,048	2.5	1030
14T	18	7	1.16	25	0.635	80	2.03	27.0	28.3	7.57	23.55	3,048	2.5	1140
16T	18	7	1.16	25	0.635	80	2.03	28.6	30.0	7.57	23.55	3,048	2.5	1280
20T	18	7	1.16	25	0.635	80	2.03	31.2	32.8	7.57	23.55	3,048	2.5	1540
24T	18	7	1.16	25	0.635	80	2.03	33.9	35.6	7.57	23.55	3,048	2.5	1810
30T	18	7	1.16	25	0.635	80	2.03	37.4	39.2	7.57	23.55	3,048	2.5	2210



Fire Fighting Cable



600V FR-3 EPR/FR-PO	
600V FR-3 EPR/FR-PO-S	
600V FR-3 EPR/FR-PO-CMS	34 ~ 36
600V FR-8 EPR/FR-PO	37 ~ 38



Fire Fighting Cable

600V FR-3 EPR/FR-PO, 600V FR-3 EPR/FR-PO-S, 600V FR-3 EPR/FR-PO-CMS

Application Standard

- Design guide : NEMA WC 70(ICEA S-95-658)(2009ed)
: ASTM B3(2001ed), B8(2004ed), B33(2004ed)
: 9-171-E242
- Flame test : IEEE 383(2003ed), IEEE 1202(1991ed), UL 1581(2001ed)
- Heat resistance : NFSC 102(2013ed), 816℃x20min

Operating Condition & Environmental Design Requirements

- Service Life : 60 years
- Temperature, °F : 50 ~ 122
- Relative Humidity, % : 5 ~ 90
- Radiation TID (Gy) : 6 x 10⁵
Total Integrated Dose (TID) for normal condition is a 60 year normal operation dose.

Aging test & Flame test

- Code & Standard : IEEE 383
 - Aging test (Funtional) : 60 year aging test (Voltage withstand + Insulation resistance)
 - Flame test : Unaged & Aged VTFT (IEEE 1202), VFT (UL 1581)
- * Refer to Technical Information (Aging & Aged Flame Test Procedure)

Construction

Classification	Code	Construction detail
Conductor		- Tin-coated annealed copper conductor (Class B)
Insulation	EPR	- EPR (Class E-II)
Cabling		- Insulated cores shall be assembled - Filler, if uesd, shall be non-hygroscopic and flame-retardant - A binder tape may be used over the assembly
Heat resisting layer	FR-3	- A heat resisting tape may be applied in the cabling
Shield	- S	- Tin-coated copper tape - A suitable tape may be applied over the shield
	- CMS	- Shielded by Copper Mylar tape(CU/PS) with tinned copper drain wire - A suitable tape may be applied over the shield
Jacket	FR-PO	- Flame retardant Poly-Olefin (FR-PO)
Identification of cores		- 1Core : Black - 2Cores : Black, White - 3Cores : Black, White, Red - 4Cores : Black, White, Red, Green - Multi Core : Identified for Method 3 as per NEMA WC 57, Appendix E

600V FR-3 EPR/FR-PO

No. of Core	Conductor			Thickness of Insulation				Thickness of Jacket				Overall diameter		Max. Conductor Resistance (at 25℃)		Insulation Resistance Constant (at 15.6℃)	Test Voltage	Cable Weight
	Nominal Area	Number of wire	Diameter of conductor	Nominal		Minimum		Nominal		Minimum		Approx.	Maximum	Max. Conductor Resistance (at 25℃)		Insulation Resistance Constant (at 15.6℃)	Test Voltage	Cable Weight
No.	AWG/KCM	EA	mm	mils	mm	mils	mm	mils	mm	mils	mm	mm	mm	Ω/1000ft	Ω/km	MΩ-km	KV/5min.	kg/km
2	14	7	1.84	45	1.143	40	1.016	45	1.14	40	1.02	11.5	12.4	2.84	8.83	3048	5.5	180
3	14	7	1.84	45	1.143	40	1.016	45	1.14	40	1.02	12.2	13.1	2.84	8.83	3048	5.5	210
4	14	7	1.84	45	1.143	40	1.016	45	1.14	40	1.02	13.3	14.4	2.84	8.83	3048	5.5	260
5	14	7	1.84	45	1.143	40	1.016	60	1.52	50	1.27	15.3	16.6	2.84	8.83	3048	5.5	340
6	14	7	1.84	45	1.143	40	1.016	60	1.52	50	1.27	16.7	18.0	2.84	8.83	3048	5.5	400
7	14	7	1.84	45	1.143	40	1.016	60	1.52	50	1.27	16.7	18.0	2.84	8.83	3048	5.5	420
8	14	7	1.84	45	1.143	40	1.016	60	1.52	50	1.27	18.0	19.4	2.84	8.83	3048	5.5	480
9	14	7	1.84	45	1.143	40	1.016	60	1.52	50	1.27	19.3	20.9	2.84	8.83	3048	5.5	550
10	14	7	1.84	45	1.143	40	1.016	60	1.52	50	1.27	21.0	22.7	2.87	8.92	3048	5.5	630
12	14	7	1.84	45	1.143	40	1.016	80	2.03	70	1.78	22.7	24.5	2.87	8.92	3048	5.5	750
14	14	7	1.84	45	1.143	40	1.016	80	2.03	70	1.78	23.8	25.7	2.87	8.92	3048	5.5	840
16	14	7	1.84	45	1.143	40	1.016	80	2.03	70	1.78	25.0	27.0	2.87	8.92	3048	5.5	930
19	14	7	1.84	45	1.143	40	1.016	80	2.03	70	1.78	26.4	27.7	2.87	8.92	3048	5.5	1050
20	14	7	1.84	45	1.143	40	1.016	80	2.03	70	1.78	27.1	28.5	2.87	8.92	3048	5.5	1110
24	14	7	1.84	45	1.143	40	1.016	80	2.03	70	1.78	30.7	32.2	2.87	8.92	3048	5.5	1390
37	14	7	1.84	45	1.143	40	1.016	80	2.03	70	1.78	35.1	36.8	2.87	8.92	3048	5.5	1900
48	14	7	1.84	45	1.143	40	1.016	80	2.03	70	1.78	40.1	42.1	2.87	8.92	3048	5.5	2460

600V FR-3 EPR/FR-PO-S

No. of Core	Conductor			Thickness of Insulation				Thickness of Jacket				Overall diameter		Max. Conductor Resistance (at 25℃)		Insulation Resistance Constant (at 15.6℃)	Test Voltage	Cable Weight
	Nominal Area	Number of wire	Diameter of conductor	Nominal		Minimum		Nominal		Minimum		Approx.	Maximum	Max. Conductor Resistance (at 25℃)		Insulation Resistance Constant (at 15.6℃)	Test Voltage	Cable Weight
No.	AWG/KCM	EA	mm	mils	mm	mils	mm	mils	mm	mils	mm	mm	mm	Ω/1000ft	Ω/km	MΩ-km	KV/5min.	kg/km
2	14	7	1.84	45	1.143	40	1.016	45	1.14	40	1.02	11.8	12.8	2.84	8.83	3048	5.5	220
3	14	7	1.84	45	1.143	40	1.016	45	1.14	40	1.02	12.5	13.5	2.84	8.83	3048	5.5	250
4	14	7	1.84	45	1.143	40	1.016	60	1.52	50	1.27	14.4	15.6	2.84	8.83	3048	5.5	330
5	14	7	1.84	45	1.143	40	1.016	60	1.52	50	1.27	15.7	16.9	2.84	8.83	3048	5.5	390
6	14	7	1.84	45	1.143	40	1.016	60	1.52	50	1.27	17.0	18.3	2.84	8.83	3048	5.5	460
7	14	7	1.84	45	1.143	40	1.016	60	1.52	50	1.27	17.0	18.3	2.84	8.83	3048	5.5	470
8	14	7	1.84	45	1.143	40	1.016	60	1.52	50	1.27	18.3	19.8	2.84	8.83	3048	5.5	540
9	14	7	1.84	45	1.143	40	1.016	60	1.52	50	1.27	19.6	21.2	2.84	8.83	3048	5.5	620
10	14	7	1.84	45	1.143	40	1.016	80	2.03	70	1.78	22.3	24.1	2.87	8.92	3048	5.5	760
12	14	7	1.84	45	1.143	40	1.016	80	2.03	70	1.78	23.0	24.8	2.87	8.92	3048	5.5	830
14	14	7	1.84	45	1.143	40	1.016	80	2.03	70	1.78	24.1	26.1	2.87	8.92	3048	5.5	920
16	14	7	1.84	45	1.143	40	1.016	80	2.03	70	1.78	25.4	27.4	2.87	8.92	3048	5.5	1020
19	14	7	1.84	45	1.143	40	1.016	80	2.03	70	1.78	26.7	28.0	2.87	8.92	3048	5.5	1140
20	14	7	1.84	45	1.143	40	1.016	80	2.03	70	1.78	27.5	28.8	2.87	8.92	3048	5.5	1210
24	14	7	1.84	45	1.143	40	1.016	80	2.03	70	1.78	31.0	32.6	2.87	8.92	3048	5.5	1500
37	14	7	1.84	45	1.143	40	1.016	80	2.03	70	1.78	35.4	37.1	2.87	8.92	3048	5.5	2030
48	14	7	1.84	45	1.143	40	1.016	80	2.03	70	1.78	40.4	42.4	2.87	8.92	3048	5.5	2610

Fire Fighting Cable

600V FR-3 EPR/FR-PO-CMS

No. of Pair	Conductor			Thickness of Insulation				Thickness of Jacket				Overall diameter		Max. Conductor Resistance (at 25°C)	Insulation Resistance Constant (at 15.6°C)	Test Voltage	Cable Weight	
	Nominal Area	Number of wire	Diameter of conductor	Nominal		Minimum		Nominal		Minimum		Approx.	Maximum					
No.	AWG/KCM	EA	mm	mils	mm	mils	mm	mils	mm	mils	mm	mm	mm	Ω/1000ft	Ω/km	MΩ-km	KV/5min.	kg/km
1	14	7	1.84	45	1.143	40	1.016	45	1.14	40	1.02	11.5	12.4	2.90	9.01	3048	5.5	190
2	14	7	1.84	45	1.143	40	1.016	60	1.52	50	1.27	18.4	19.9	2.90	9.01	3048	5.5	450
3	14	7	1.84	45	1.143	40	1.016	60	1.52	50	1.27	19.7	21.3	2.90	9.01	3048	5.5	530
4	14	7	1.84	45	1.143	40	1.016	60	1.52	50	1.27	21.0	22.7	2.90	9.01	3048	5.5	620
5	14	7	1.84	45	1.143	40	1.016	80	2.03	70	1.78	24.6	26.6	2.90	9.01	3048	5.5	830
6	14	7	1.84	45	1.143	40	1.016	80	2.03	70	1.78	26.4	27.7	2.90	9.01	3048	5.5	950
7	14	7	1.84	45	1.143	40	1.016	80	2.03	70	1.78	27.2	28.6	2.90	9.01	3048	5.5	1040
8	14	7	1.84	45	1.143	40	1.016	80	2.03	70	1.78	29.0	30.4	2.90	9.01	3048	5.5	1170
9	14	7	1.84	45	1.143	40	1.016	80	2.03	70	1.78	31.1	32.7	2.90	9.01	3048	5.5	1340
10	14	7	1.84	45	1.143	40	1.016	80	2.03	70	1.78	32.9	34.5	2.90	9.01	3048	5.5	1490
12	14	7	1.84	45	1.143	40	1.016	80	2.03	70	1.78	34.2	35.9	2.90	9.01	3048	5.5	1640

600V FR-8 EPR/FR-PO

Application Standard

- Design guide : NEMA WC 70(ICEA S-95-658)(2009ed)
: ASTM B3(2001ed), B8(2004ed), B33(2004ed)
: 9-171-E242
- Flame test : IEEE 383(2003ed), IEEE 1202(1991ed), UL 1581(2001ed)
- Fire resistancet : KS C IEC 60331-21(2003ed), 750°Cx180min

Operating Condition & Environmental Design Requirements

- Service Life : 60 years
- Temperature, °F : 50 ~ 122
- Relative Humidity, % : 5 ~ 90
- Radiation TID (Gy) : 6 x 10⁵
Total Integrated Dose (TID) for normal condition is a 60 year normal operation dose.

Aging test & Flame test

- Code & Standard : IEEE 383
- Aging test (Funtional) : 60 year aging test (Voltage withstand + Insulation resistance)
- Flame test : Unaged & Aged VTFT (IEEE 1202), VFT (UL 1581)
* Refer to Technical Information (Aging & Aged Flame Test Procedure)

Construction

Classification	Code	Construction detail
Conductor		- Tin-coated annealed copper conductor (Class B)
Fire resisting layer	FR-8	- A fire resisting tape may be applied in the conductor - A suitable tape may be applied over the fire resisting tape
Insulation	EPR	- EPR (Class E-II)
Cabling		- Insulated cores shall be assembled - Filler, if uesd, shall be non-hygroscopic and flame-retardant - A binder tape may be used over the assembly
Jacket	FR-PO	- Flame retardant Poly-Olefin (FR-PO)
Identification of cores		- 1Core : Black - 2Cores : Black, White - 3Cores : Black, White, Red - 4Cores : Black, White, Red, Green - Multi Core : Identified for Method 3 as per NEMA WC 57, Appendix E

Fire Fighting Cable

600V FR-8 EPR/FR-PO

No. of Core	Conductor			Thickness of Insulation				Thickness of Jacket				Overall diameter		Max. Conductor Resistance (at 25°C)		Insulation Resistance Constant (at 15.6°C)	Test Voltage	Cable Weight
	Nominal Area	Number of wire	Diameter of conductor	Nominal		Minimum		Nominal		Minimum		Approx.	Maximum					
No.	AWG/KCM	EA	mm	mils	mm	mils	mm	mils	mm	mils	mm	mm	mm	Ω/1000ft	Ω/km	MΩ-km	KV/5min.	kg/km
2	14	7	1.84	45	1.143	40	1.016	45	1.14	40	1.02	12.3	13.2	2.84	8.83	3048	5.5	200
3	14	7	1.84	45	1.143	40	1.016	45	1.14	40	1.02	13.0	14.0	2.84	8.83	3048	5.5	240
4	14	7	1.84	45	1.143	40	1.016	60	1.52	50	1.27	15.0	16.2	2.84	8.83	3048	5.5	320
5	14	7	1.84	45	1.143	40	1.016	60	1.52	50	1.27	16.4	17.7	2.84	8.83	3048	5.5	380
6	14	7	1.84	45	1.143	40	1.016	60	1.52	50	1.27	17.9	19.3	2.84	8.83	3048	5.5	450
7	14	7	1.84	45	1.143	40	1.016	60	1.52	50	1.27	17.9	19.3	2.84	8.83	3048	5.5	470
8	14	7	1.84	45	1.143	40	1.016	60	1.52	50	1.27	19.3	20.9	2.84	8.83	3048	5.5	540
9	14	7	1.84	45	1.143	40	1.016	60	1.52	50	1.27	20.8	22.5	2.84	8.83	3048	5.5	620
10	14	7	1.84	45	1.143	40	1.016	80	2.03	70	1.78	23.7	25.5	2.87	8.92	3048	5.5	770
12	14	7	1.84	45	1.143	40	1.016	80	2.03	70	1.78	24.4	26.3	2.87	8.92	3048	5.5	850
14	14	7	1.84	45	1.143	40	1.016	80	2.03	70	1.78	25.6	26.9	2.87	8.92	3048	5.5	950
16	14	7	1.84	45	1.143	40	1.016	80	2.03	70	1.78	27.0	28.4	2.87	8.92	3048	5.5	1060
19	14	7	1.84	45	1.143	40	1.016	80	2.03	70	1.78	28.4	29.9	2.87	8.92	3048	5.5	1190
20	14	7	1.84	45	1.143	40	1.016	80	2.03	70	1.78	29.3	30.8	2.87	8.92	3048	5.5	1260
24	14	7	1.84	45	1.143	40	1.016	80	2.03	70	1.78	33.2	34.9	2.87	8.92	3048	5.5	1580
37	14	7	1.84	45	1.143	40	1.016	80	2.03	70	1.78	38.0	39.9	2.87	8.92	3048	5.5	2170
48	14	7	1.84	45	1.143	40	1.016	110	2.79	95	2.41	45.2	47.4	2.87	8.92	3048	5.5	2990



XHHW Cable(Switchboard / Lighting)



600V XHHW (Switchboard), 600V XHHW (Lighting) 40 ~ 44



XHHW Cable (Switchboard / Lighting)

600V XHHW (Switchboard), 600V XHHW (Lighting)

Application Standard

- Design guide
- : NEMA WC 70(ICEA S-95-658)(2009ed)
- : ASTM B3(2001ed), B8(2004ed), B33(2004ed), B172(2010ed), B174(2010ed)
- : 9-171-E242
- Flame test
- : IEEE 383(2003ed), IEEE 1202(1991ed), UL 1581(2001ed)

Operating Condition & Environmental Design Requirements

- Service Life : 60 years
- Temperature, °F : 50 ~ 122
- Relative Humidity, % : 5 ~ 90
- Radiation TID (Gy) : 6 x 10⁵
- Total Integrated Dose (TID) for normal condition is a 60 year normal operation dose.

Aging test & Flame test

- Code & Standard : IEEE 383
- Aging test (Funtional) : 60 year aging test (Voltage withstand + Insulation resistance)
- Flame test : Unaged & Aged VTFT (IEEE 1202), VFT (UL 1581)
- * Refer to Technical Information (Aging & Aged Flame Test Procedure)

Construction

Classification	Code	Construction detail
Conductor		- Tin-coated annealed copper conductor (Class A, Class B, Class K)
Insulation	XHHW	- Thermoset compound

XHHW Cable (Switchboard)



600V XHHW (Switchboard, Class A)

No. of Core	Conductor			Thickness of Insulation				Overall Diameter		Max. Conductor Resistance (at 25℃)		Insulation Resistance Constant (at 15.6℃)	Test Voltage	Cable Weight
	Nominal Area	Number of wire	Diameter of conductor	Nominal		Minimum		Approx.	Maximum					
No.	AWG/KCM	EA	mm	mils	mm	mils	mm	mils	mm	Ω/1000ft	Ω/km	MΩ-km	KV/5min.	kg/km
1/C	12	1	2.05	30	0.762	28	0.711	3.8	4.1	1.71	5.61	3,048	3.5	50
1/C	10	1	2.59	30	0.762	28	0.711	4.3	4.6	1.08	3.54	3,048	3.5	70
1/C	9	1	2.91	30	0.762	28	0.711	4.6	5.0	0.848	2.785	3,048	3.5	80
1/C	8	1	3.26	45	1.143	40	1.016	5.8	6.2	0.672	2.203	3,048	5.5	110
1/C	7	1	3.67	45	1.143	40	1.016	6.2	6.7	0.532	1.744	3,048	5.5	130
1/C	6	1	4.12	45	1.143	40	1.016	6.6	7.1	0.422	1.387	3,048	5.5	160
1/C	5	1	4.62	45	1.143	40	1.016	7.1	7.7	0.336	1.102	3,048	5.5	190
1/C	4	1	5.19	45	1.143	40	1.016	7.7	8.3	0.266	0.873	3,048	5.5	240

600V XHHW (Switchboard, Class B)

No. of Core	Conductor			Thickness of Insulation				Overall Diameter		Max. Conductor Resistance (at 25℃)		Insulation Resistance Constant (at 15.6℃)	Test Voltage	Cable Weight
	Nominal Area	Number of wire	Diameter of conductor	Nominal		Minimum		Approx.	Maximum					
No.	AWG/KCM	EA	mm	mils	mm	mils	mm	mm	mm	Ω/1000ft	Ω/km	MΩ-km	KV/5min.	kg/km
1/C	18	7	1.16	30	0.762	28	0.711	2.9	3.1	7.21	22.4	3,048	3.5	20
1/C	16	7	1.46	30	0.762	28	0.711	3.2	3.4	4.52	14.1	3,048	3.5	30
1/C	14	7	1.84	30	0.762	28	0.711	3.6	3.8	2.78	8.66	3,048	3.5	40
1/C	12	7	2.31	30	0.762	28	0.711	4.0	4.4	1.75	5.75	3,048	3.5	50
1/C	10	7	2.95	30	0.762	28	0.711	4.6	5.0	1.10	3.61	3,048	3.5	70
1/C	9	7	3.30	30	0.762	28	0.711	5.0	5.4	0.873	2.86	3,048	3.5	80
1/C	8	7	3.71	45	1.143	40	1.016	6.2	6.7	0.692	2.26	3,048	5.5	110
1/C	7	7	4.17	45	1.143	40	1.016	6.6	7.2	0.549	1.80	3,048	5.5	140
1/C	6	7	4.67	45	1.143	40	1.016	7.3	7.8	0.436	1.43	3,048	5.5	170
1/C	5	7	5.23	45	1.143	40	1.016	7.8	8.5	0.345	1.13	3,048	5.5	210
1/C	4	7	5.89	45	1.143	40	1.016	8.5	9.1	0.274	0.900	3,048	5.5	250
1/C	3	7	6.60	45	1.143	40	1.016	9.2	9.9	0.217	0.713	3,048	5.5	310
1/C	2	7	7.42	45	1.143	40	1.016	10.0	10.8	0.172	0.565	3,048	5.5	380
1/C	1	19	8.43	55	1.397	50	1.270	11.5	12.5	0.137	0.449	3,048	7.0	490
1/C	1/0	19	9.47	55	1.397	50	1.270	12.5	13.5	0.108	0.355	3,048	7.0	600
1/C	2/0	19	10.64	55	1.397	50	1.270	13.7	14.8	0.0859	0.282	3,048	7.0	740
1/C	3/0	19	11.94	55	1.397	50	1.270	15.0	16.2	0.0680	0.223	3,048	7.0	920
1/C	4/0	19	13.41	55	1.397	50	1.270	16.5	17.8	0.0534	0.175	3,048	7.0	1140
1/C	250	37	14.61	65	1.651	60	1.524	18.2	19.7	0.0457	0.150	3,048	8.0	1350

XHHW Cable (Switchboard)

600V XHHW (Switchboard, Class K)

No. of Core	Conductor			Thickness of Insulation				Overall Diameter		Max. Conductor Resistance (at 25°C)		Insulation Resistance Constant (at 15.6°C)	Test Voltage	Cable Weight
	Nominal Area	Number of wire	Diameter of conductor	Nominal		Minimum		Approx.	Maximum					
No.	AWG/KCM	EA	mm	mils	mm	mils	mm	mm	mm	Ω/1000ft	Ω/km	MΩ-km	KV/5min.	kg/km
1/C	18	0.254	1.17	30	0.762	28	0.711	2.9	3.1	7.29	23.9	3,048	3.5	20
1/C	16	0.254	1.49	30	0.762	28	0.711	3.2	3.4	4.58	15.0	3,048	3.5	30
1/C	14	0.254	1.88	30	0.762	28	0.711	3.6	3.9	2.88	9.42	3,048	3.5	30
1/C	12	0.254	2.36	30	0.762	28	0.711	4.1	4.4	1.81	5.92	3,048	3.5	50
1/C	10	0.254	2.99	30	0.762	28	0.711	4.7	5.1	1.14	3.74	3,048	3.5	70
1/C	9	0.254	3.70	30	0.762	28	0.711	5.5	5.9	0.920	3.01	3,048	3.5	90
1/C	8	0.254	4.16	45	1.143	40	1.016	6.7	7.3	0.729	2.39	3,048	5.5	120
1/C	7	0.254	4.65	45	1.143	40	1.016	7.2	7.8	0.578	1.89	3,048	5.5	140
1/C	6	0.254	5.24	45	1.143	40	1.016	7.8	8.4	0.459	1.50	3,048	5.5	170
1/C	5	0.254	5.89	45	1.143	40	1.016	8.9	9.6	0.364	1.19	3,048	5.5	220
1/C	4	0.254	6.58	45	1.143	40	1.016	9.6	10.3	0.289	0.947	3,048	5.5	260
1/C	3	0.254	7.39	45	1.143	40	1.016	10.4	11.2	0.232	0.759	3,048	5.5	320
1/C	2	0.254	8.26	45	1.143	40	1.016	11.2	12.1	0.184	0.602	3,048	5.5	390
1/C	1	0.254	9.27	55	1.397	50	1.270	12.7	13.8	0.145	0.474	3,048	7.0	490
1/C	1/0	0.254	10.45	55	1.397	50	1.270	13.9	15.0	0.115	0.377	3,048	7.0	610
1/C	2/0	0.254	13.24	55	1.397	50	1.270	16.7	18.1	0.0922	0.302	3,048	7.0	770
1/C	3/0	0.254	14.86	55	1.397	50	1.270	18.3	19.8	0.0731	0.240	3,048	7.0	950
1/C	4/0	0.254	16.71	55	1.397	50	1.270	20.2	21.8	0.0580	0.190	3,048	7.0	1180

XHHW Cable (Lighting)



600V XHHW (Lighting, Class A)

No. of Core	Conductor			Thickness of Insulation				Overall Diameter		Max. Conductor Resistance (at 25°C)		Insulation Resistance Constant (at 15.6°C)	Test Voltage	Cable Weight
	Nominal Area	Number of wire	Diameter of conductor	Nominal		Minimum		Approx.	Maximum					
No.	AWG/KCM	EA	mm	mils	mm	mils	mm	mm	mm	Ω/1000ft	Ω/km	MΩ-km	KV/5min.	kg/km
1/C	12	1	2.05	45	1.143	40	1.016	4.6	4.9	1.71	5.61	3,048	3.5	50
1/C	10	1	2.59	45	1.143	40	1.016	5.1	5.5	1.08	3.54	3,048	3.5	80
1/C	9	1	2.91	45	1.143	40	1.016	5.4	5.8	0.848	2.785	3,048	3.5	90
1/C	8	1	3.26	60	1.524	55	1.397	6.7	7.2	0.672	2.203	3,048	5.5	120

600V XHHW (Lighting, Class B)

No. of Core	Conductor			Thickness of Insulation				Overall Diameter		Max. Conductor Resistance (at 25°C)		Insulation Resistance Constant (at 15.6°C)	Test Voltage	Cable Weight
	Nominal Area	Number of wire	Diameter of conductor	Nominal		Minimum		Approx.	Maximum					
No.	AWG/KCM	EA	mm	mils	mm	mils	mm	mm	mm	Ω/1000ft	Ω/km	MΩ-km	KV/5min.	kg/km
1/C	18	7	1.16	45	1.143	40	1.016	3.7	4.0	7.21	22.4	3,048	3.5	30
1/C	16	7	1.46	45	1.143	40	1.016	4.0	4.3	4.52	14.1	3,048	3.5	30
1/C	14	7	1.84	45	1.143	40	1.016	4.4	4.7	2.78	8.66	3,048	3.5	40
1/C	12	7	2.31	45	1.143	40	1.016	4.8	5.2	1.75	5.75	3,048	3.5	60
1/C	10	7	2.95	45	1.143	40	1.016	5.4	5.9	1.10	3.61	3,048	3.5	80
1/C	9	7	3.30	45	1.143	40	1.016	5.8	6.3	0.873	2.86	3,048	3.5	100
1/C	8	7	3.71	60	1.524	55	1.397	7.1	7.7	0.692	2.26	3,048	5.5	130
1/C	7	7	4.17	60	1.524	55	1.397	7.5	8.1	0.549	1.80	3,048	5.5	150
1/C	6	7	4.67	60	1.524	55	1.397	8.2	8.8	0.436	1.43	3,048	5.5	190
1/C	5	7	5.23	60	1.524	55	1.397	8.7	9.4	0.345	1.13	3,048	5.5	220
1/C	4	7	5.89	60	1.524	55	1.397	9.4	10.1	0.274	0.900	3,048	5.5	270
1/C	3	7	6.60	60	1.524	55	1.397	10.1	10.9	0.217	0.713	3,048	5.5	330
1/C	2	7	7.42	60	1.524	55	1.397	10.9	11.8	0.172	0.565	3,048	5.5	400
1/C	1	19	8.43	80	2.032	75	1.905	12.9	14.0	0.137	0.449	3,048	7.0	530
1/C	1/0	19	9.47	80	2.032	75	1.905	13.9	15.0	0.108	0.355	3,048	7.0	640
1/C	2/0	19	10.64	80	2.032	75	1.905	15.1	16.3	0.0859	0.282	3,048	7.0	790
1/C	3/0	19	11.94	80	2.032	75	1.905	16.4	17.7	0.0680	0.223	3,048	7.0	970
1/C	4/0	19	13.41	80	2.032	75	1.905	17.9	19.3	0.0534	0.175	3,048	7.0	1200

XHHW Cable (Lighting)

600V XHHW (Lighting, Class K)

No. of Core	Conductor			Thickness of Insulation				Overall Diameter		Max. Conductor Resistance (at 25℃)		Insulation Resistance Constant (at 15.6℃)	Test Voltage	Cable Weight
	Nominal Area	Number of wire	Diameter of conductor	Nominal		Minimum		Approx.	Maximum					
No.	AWG/KCM	EA	mm	mils	mm	mils	mm	mm	mm	Ω/1000ft	Ω/km	MΩ-km	KV/5min.	kg/km
1/C	18	0.254	1.17	45	1.143	40	1.016	3.7	4.0	7.29	23.9	3,048	3.5	30
1/C	16	0.254	1.49	45	1.143	40	1.016	4.0	4.3	4.58	15.0	3,048	3.5	30
1/C	14	0.254	1.88	45	1.143	40	1.016	4.4	4.7	2.88	9.42	3,048	3.5	40
1/C	12	0.254	2.36	45	1.143	40	1.016	4.9	5.2	1.81	5.92	3,048	3.5	60
1/C	10	0.254	2.99	45	1.143	40	1.016	5.5	5.9	1.14	3.74	3,048	3.5	80
1/C	9	0.254	3.70	45	1.143	40	1.016	6.3	6.8	0.920	3.01	3,048	3.5	100
1/C	8	0.254	4.16	60	1.524	55	1.397	7.6	8.3	0.729	2.39	3,048	5.5	130
1/C	7	0.254	4.65	60	1.524	55	1.397	8.1	8.8	0.578	1.89	3,048	5.5	160
1/C	6	0.254	5.24	60	1.524	55	1.397	8.7	9.4	0.459	1.50	3,048	5.5	190
1/C	5	0.254	5.89	60	1.524	55	1.397	9.8	10.5	0.364	1.19	3,048	5.5	230
1/C	4	0.254	6.58	60	1.524	55	1.397	10.5	11.3	0.289	0.947	3,048	5.5	280
1/C	3	0.254	7.39	60	1.524	55	1.397	11.3	12.2	0.232	0.759	3,048	5.5	340
1/C	2	0.254	8.26	60	1.524	55	1.397	12.1	13.1	0.184	0.602	3,048	5.5	420
1/C	1	0.254	9.27	80	2.032	75	1.905	14.1	15.3	0.145	0.474	3,048	7.0	540
1/C	1/0	0.254	10.45	80	2.032	75	1.905	15.3	16.6	0.115	0.377	3,048	7.0	660
1/C	2/0	0.254	13.24	80	2.032	75	1.905	18.1	19.6	0.0922	0.302	3,048	7.0	830
1/C	3/0	0.254	14.86	80	2.032	75	1.905	19.7	21.3	0.0731	0.240	3,048	7.0	1010
1/C	4/0	0.254	16.71	80	2.032	75	1.905	21.6	23.3	0.0580	0.190	3,048	7.0	1250



Technical Information



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Technical Information

1. Rated Ampacity for Cable

5 to 15kV Shielded Single Conductor Extruded Dielectric Power Cable
in Free Air, 40℃ ambient, Max. Conductor Temp. : 90℃

Conductor Size (AWG/KCM)	Sunshine			
	No sun		Full sun	
	Wind speed			
	0Ft/s	2Ft/s	0Ft/s	2Ft/s
2	197	217	148	178
1	226	249	170	204
1/0	258	285	194	233
2/0	295	326	221	265
3/0	337	371	252	302
4/0	383	422	286	342
250	429	473	320	382
350	519	570	386	459
500	624	684	462	548
750	737	804	543	638
1000	882	958	647	756

0.6 to 4kV Unshielded Single Conductor Extruded Dielectric Cable
in Free Air, 40℃ ambient, Max. Conductor Temp. : 90℃

Conductor Size (AWG/KCM)	Sunshine			
	No sun		Full sun	
	Wind speed			
	0Ft/s	2Ft/s	0Ft/s	2Ft/s
12	36	48	29	43
10	48	63	39	57
8	66	85	53	76
6	89	113	71	100
4	120	150	95	132
2	162	201	128	175
1	195	235	152	203
1/0	226	272	176	234
2/0	264	315	205	269
3/0	308	365	238	310
4/0	359	422	277	357
250	405	472	310	396
300	456	530	349	444
350	504	584	385	488
400	550	635	419	529
500	634	729	481	603
600	714	815	540	671
750	815	926	614	759
1000	957	1081	717	879

600V XHHW Cable
in Free Air on 40℃ ambient

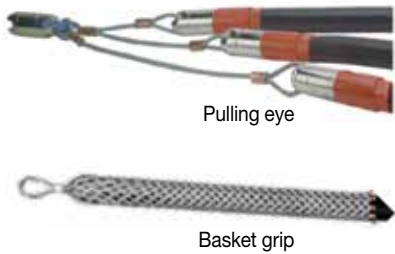
Conductor Size (AWG/KCM)	18	16	14	12	10	8	6	4	3	2	1	1/0	2/0	3/0	4/0	250
Continuous Rating	16	21	31	36	50	72	95	127	150	172	200	236	273	318	368	414

2. Installation

1) Installation temperature
Minimum recommended installation temperature for cables shall be -16.7℃ (1.94°F)

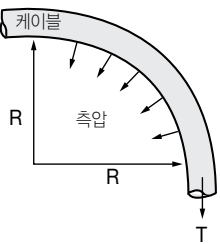
2) Maximum Allowable Pulling tension (IEEE 690)

A. Pulling eye
 $T_{max} = K * N * cmil$
 T_{max} = maximum pulling tension (lb)
cmil = circular mil area of each conductor
N = number of conductors
K = 0.008 lb (copper)



B. Basket Grip
Non-shielded jacketed cable = 2000lb
Shielded jacketed cable = 1000lb

C. Maximum Allowable Sidewall Pressure
Sidewall pressure is the radial force exerted on the insulation and sheath of a cable at a bend point when the cable is under tension.
The maximum allowable sidewall pressure is 500lb/ft of radius for cables.

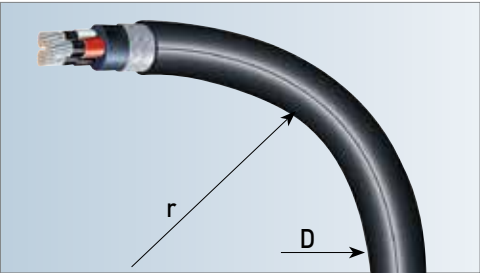


3) Minimum Bending Radius
The bending radius for the installation of cables should be not less than the values given as follows;

A. HV Power cables

Cable Type	Overall diameter of cable (mm)		
	~ 19.0	19.0 ~ 38.2	38.2 ~
Single Conductor Shielded	12 x D	12 x D	15 x D
Multiple Conductor with Individually Shielded Conductor	12 / 7*	12 / 7*	12 / 7*

Note D : Overall diameter of cable
* 12x individual shielded conductor diameter, or 7xoverall diameter of cable, whichever is the greater.



B. Power cables

a) Non-shielded Power cables

Thickness of Conductor insulation	Overall diameter of cable (mm)		
	~ 25.4	25.4 ~ 50.8	50.8 ~
4.31 and less	4 x D	5 x D	6 x D
4.32 and more	5 x D	6 x D	7 x D

Note D : Overall diameter of cable

b) Shielded Power cables

Cable Type	Overall diameter of cable (mm)		
	~ 25.4	25.4 ~ 50.8	50.8 ~
Single & Multi	12 x D	12 x D	12 x D
Multiplexed	7 x D	7 x D	7 x D

C. Control & Instrumentation cables

a) Control cables

Cable Type	Overall diameter of cable (mm)		
	~ 19	19.1 ~ 38.1	38.13 ~
Multi conductor with flat tape	12 x D	12 x D	12 x D

Note D : Overall diameter of cable

b) Instrumentation cables

Cable Type	Overall diameter of cable (mm)		
	~ 19	19.1 ~ 38.1	38.13 ~
Single, Multi Pair with shielded	6 x D	6 x D	6 x D

Technical Information

3. Cable Identification method

- 1) Method 1 (ICEA S-73-532(NEMA WC 57) Appendix E)
- Core identification by insulation color ex) Black, White, Red
 - Application : 600V Power Cable (1Core ~ 4Core), 600V Control Cable (2Core ~ 3Core)

- 2) Method 3 (ICEA S-73-532(NEMA WC 57) Appendix E)
- Black numbering on White insulation

Conductor No.	Backgroud or base color	First tracer color	Second Tracer color	Conductor No.	Backgroud or base color	First tracer color	Second Tracer color
1	Black	-	-	20	Red	Green	-
2	White	-	-	21	Orange	Green	-
3	Red	-	-	22	Black	White	Red
4	Green	-	-	23	White	Black	Red
5	Orange	-	-	24	Red	Black	White
6	Blue	-	-	25	Green	Black	White
7	White	Black	-	26	Orange	Black	White
8	Red	Black	-	27	Blue	Black	White
9	Green	Black	-	28	Black	Red	Green
10	Orange	Black	-	29	White	Red	Green
11	Blue	Black	-	30	Red	Black	Green
12	Black	White	-	31	Green	Black	Orange
13	Red	White	-	32	Orange	Black	Green
14	Green	White	-	33	Blue	White	Orange
15	Blue	White	-	34	Black	White	Orange
16	Black	Red	-	35	White	Red	Orange
17	White	Red	-	36	Orange	White	Blue
18	Orange	Red	-	37	White	Red	Blue
19	Blue	Red	-				

- Application : 600V Power Cable (5Core ~), 600V Control Cable (4Core ~)

- 3) Instrumentation Cable
- Pairs : For pairs, one conductor of each shall be colored ""Black"" or ""Whtie"" and the other conductor shall be colored with and other contracting color.
Pairs shall be identified in sequence by same printed numbers on both conductor in each pair beginning with the numbet 1.
 - Triads : For triads, each triad shall consist of one black conductor, one white conductor and one red conductor. Triads shall be identified in sequence by same printed number on three conductors in each triads, beginning with the number 1.

4. AWG(American Wire Gauge) to mm²

(Millimeters Squared) Conversion

AWG to mm² Conversion Table	
AWG/Kcmil	[mm²]*
20	0.52
18	0.82
16	1.31
14	2.08
12	3.31
10	5.26
8	8.36
6	13.3
4	21.2
2	33.6
1	42.4
1/0	53.5
2/0	67.4
3/0	85
4/0	107
250	127
300	152
350	177
400	203
450	228
500	253
600	304
750	380
800	405
1000	507

* Equivalent mm² cross-sectional area

mm² to AWG Conversion Table		
mm²	[mm²]*	AWG/Kcmil
0.5	0.52	20
0.75	0.82	18
1.5	1.31	16
2.5	2.08	14
2.5	3.31	12
4	3.31	12
6	5.26	10
10	8.36	8
16	13.3	6
25	21.2	4
35	33.6	2
35	42.4	1
50	53.5	1/0
70	67.4	2/0
95	85	3/0
95	107	4/0
120	107	4/0
120	127	250
150	152	300
185	177	350
185	203	400
240	228	450
240	253	500
300	304	600
400	380	750
400	405	800
500	507	1000

* Equivalent mm² cross-sectional area

Technical Information

5. Recommended Reel Handling Practices

How to Handle Cable Reels

O



Cradle both reel flanges between forks.

X



Do not lift by top flange. Cable or reel will be damaged.

O

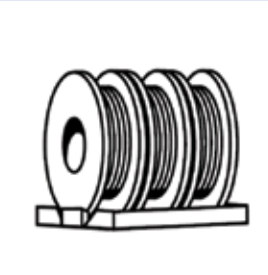


Reels can be hoisted with a shaft extended through both flanges.

X



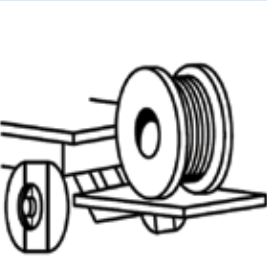
Use a spreader bar to prevent bending the reel flanges and mashing the cable.



Always load with flanges on edge and chock and block securely.



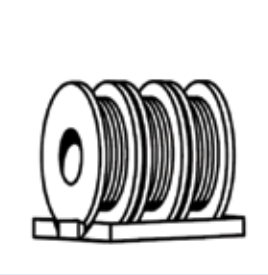
Upended heavy reels will often arrive damaged. Reduse or receive subject to inspection for hidden damage.



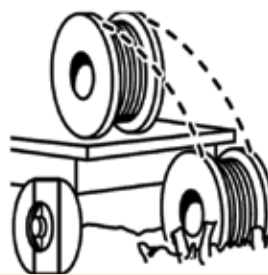
Low reels from truck using hysraulic gate, hoist or fork lift. Lower carefully.



Never allow forks to touch cable surface or reel wrap.



Alwaysd load with flanged on edge and chock and block securely.



Never drop reels.

6. Aging & Aged Flame Test Procedure

- 1) Definition

A. Aging Test

Test to evaluate whether the cable satisfies **functional characteristics** after total thermal aging and radiation dose irradiation during the design life of the Nuclear Power Plant.

B. Aged Flame Test

Test to evaluate whether the cable satisfies **flame retardant characteristics** after total thermal aging and radiation dose irradiation during the design life of the Nuclear Power Plant.

2) Activation Energy calculation

Cable Type	Classification	Material	Activation Energy (A/E)
Medium Voltage Cable	Insulation	EPR	1.358 eV
	Jacket	FR-PO	1.095 eV
Low Voltage Cable	Insulation	EPR	1.421 eV
	Jacket	FR-PO	1.095 eV

The above information for activation energy is accoding to Dt&C Test Report (No. DRCREL 1805-0276 Rev.1)

3) Aging Test & Aged Flame Test Sequence

Test Step	Aging Test (Functional Test)	Aged Flame Test
Initial Inspection	Visual Inspection (Identification No. Physical Damage etc.)	
Baseline Fuctional Test	Insulation resistance (Greater than 1x10 ⁶ ohms)	N/A
Normal Radiation Exposure	Total integrated dose(TID) is follow Normal cable : 1.5x10 ⁴ Gy Fire fighting & XHHW : 6x10 ⁵ Gy	
Thermal Aging Test	Aging for 60years at maximum continuous conductor temperature using activation energy	
Bend Test	Stright out and wrapped on not exceeding 20times mandrels	N/A
Post-Bend Fuctional Test	Voltage withstand (80V/mil AC. Immersed in tap water) Insulation resistance (Greater than 1x10 ⁶ ohms)	N/A
Final Inspection	Visual Inspection (Identification No. Physical Damage etc.)	
Flame Test	N/A	VTFT for complete cable (IEEE 1202) VFT for insulated wire (UL 1581)