PRYSMIAN

Airborne.

Bare overhead conductors perfectly adapted to Australia.

A brand of the Prysmian Group

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Bare overhead conductors perfectly adapted to Australia.

What's Australian and spans our skies? Prysmian's bare overhead conductors of course! From low voltage to high voltage and everything in between our conductors can be tailor-made to fit your specific needs. Fully compliant to Australian/New Zealand Standards, Prysmian gives you the power to soar.

The sky's the limit.

Proudly manufacturing in Australia since the 1940's, Prysmian Australia understands local standards and conditions. We know what it takes to overcome the challenges that the tough Australian environment presents.

To ensure our conductors survive in Australia's harsh marine coastal areas we developed a manufacturing application allowing us to grease conductors to the requirements of IEC 61089. The development was made to ensure a consistent application of grease in manufactured conductors to eliminate preventable premature corrosion due to grease 'holiday'.

This is one example of how our unique combination of local know-how combined with the strength of being a global market leader enables us to provide integrated, value-added solutions for our customers.

Bare overhead power lines vary in size from small capacity low voltage distribution lines to 700 kV transmission lines on steel towers.

Prysmian understands that the conductor materials must be selected to best suit the specific application and standards at hand. Our selection process takes into account the physical and electrical requirements pertaining to each installation whilst at the same time delivering the most cost effective solution.

We take pride in ensuring that our customers' needs are met with fit-for-purpose solutions and that's why doing business with us pays off.

CONDUCTORS DESIGNED TO AUSTRALIAN/NEW ZEALAND STANDARDS

AAC 1350 – ALL ALUMINIUM CONDUCTORS

Standard sizes to AS/NZS 1531

Physical characteristics

Product code	Strand/wire diameter No/mm	Nominal C.S.A. mm^2	Nominal O.D. mm	Approximate Mass kg/km	Calculated minimum breaking load kN	Calculated final modulus of elasticity GPa	Coefficient of linear expansion /°C x 10^{-6}
LEO	7/2.50	34.4	7.5	94.3	5.7	65	23
LEONIDS	7/2.75	41.6	8.3	113	6.7	65	23
LIBRA	7/3.00	49.5	9.0	135	7.9	65	23
MARS	7/3.75	77.3	11.3	212	11.8	65	23
MECURY	7/4.50	111	13.5	304	16.9	65	23
MOON	7/4.75	124	14.3	339	18.9	65	23
NEPTUNE	19/3.25	158	16.3	433	24.7	65	23
ORION	19/3.50	183	17.5	503	28.7	65	23
PLUTO	19/3.75	210	18.8	576	31.9	65	23
SATURN	37/3.00	262	21.0	721	42.2	64	23
SIRUS	37/3.25	307	22.8	845	48.2	64	23
TAURUS	19/4.75	337	23.8	924	51.3	65	23
TRITON	37/3.75	409	26.3	1120	62.1	64	23
TROJANS	61/3.00	431	27.0	1192	66.0	64	23
URANUS	61/3.25	506	29.3	1400	75.2	64	23
URSULA	61/3.50	587	31.5	1620	87.3	64	23
VENUS	61/3.75	674	33.8	1860	97.2	64	23
VIRGO	91/4.50	1450	49.5	4010	207	64	23

Electrical characteristics

Product code	Equivalent area		Resistance		Current ratings (Rural weathered)				Current ratings (Industrial)				Geo-metric mean radius mm	Inductive reactance (X_a) to 0.3048m Ω/km
					Winter night		Summer noon		Winter night		Summer noon			
	Copper mm^2	Alum mm^2	D.C. at 20°C /km	A.C. at 75°C /km	Still air Amps	1 m/s wind Amps	Still air Amps	1 m/s wind Amps	Still air Amps	1 m/s wind Amps	Still air Amps	1 m/s wind Amps		
LEO	21.3	33.9	0.833	1.020	125	210	95	188	135	217	89	185	2.72	0.296
LEONIDS	25.8	41.1	0.689	0.842	142	237	107	211	154	245	100	208	2.99	0.290
LIBRA	30.7	48.9	0.579	0.706	159	265	119	235	173	273	111	231	3.27	0.285
MARS	47.9	76.3	0.370	0.452	215	351	157	309	235	364	145	303	4.08	0.272
MECURY	69.0	110.0	0.258	0.314	274	441	197	386	302	459	179	377	4.90	0.260
MOON	76.9	122.0	0.232	0.282	295	472	210	411	325	491	191	402	5.17	0.256
NEPTUNE	97.0	154.0	0.183	0.223	351	551	244	477	387	575	219	465	6.16	0.245
ORION	113.0	180.0	0.157	0.193	390	607	270	523	431	634	243	509	6.63	0.241
PLUTO	129.0	206.0	0.137	0.168	430	662	296	568	476	692	265	553	7.10	0.236
SATURN	161.0	256.0	0.110	0.135	503	762	344	650	557	799	306	631	8.06	0.228
SIRUS	189.0	301.0	0.094	0.115	563	843	382	715	624	885	339	683	8.73	0.223
TAURUS	208.0	331.0	0.0857	0.105	600	893	406	756	666	938	360	732	9.00	0.221
TRITON	252.0	400.0	0.0706	0.087	690	1011	463	851	766	1065	408	823	10.08	0.214
TROJANS	265.0	422.0	0.0671	0.082	715	1045	479	878	796	1102	422	848	10.42	0.212
URANUS	311.0	495.0	0.0572	0.071	801	1158	533	967	892	1222	468	933	11.29	0.207
URSULA	369.0	574.0	0.0593	0.061	863	1247	589	1058	993	1347	478	868	12.16	0.202
VENUS	414.0	659.0	0.0429	0.054	982	1391	646	1150	1097	1474	563	1106	13.03	0.198
VIRGO	885.0	1410.0	0.020	0.027	1690	2321	1073	1828	1899	2477	915	1740	19.16	0.174

The cables described in this technical manual are designed to be used for the supply of electrical energy in fixed applications up to the rated voltages at a nominal power frequency between 49Hz and 61Hz.

AAAC 1120 – ALL ALUMINIUM ALLOY CONDUCTORS

Standard sizes to AS/NZS 1531

Physical characteristics

Product code	Strand/wire diameter No/mm	Nominal C.S.A. mm^2	Nominal O.D. mm	Approximate Mass kg/km	Calculated minimum breaking load kN	Calculated final modulus of elasticity GPa	Coefficient of linear expansion /°C x 10^{-6}
CHLORINE	7/2.50	34.4	7.5	94.3	8.2	65	23
CHROMIUM	7/2.75	41.6	8.3	113	9.9	65	23
FLUORINE	7/3.00	49.5	9.0	135	11.8	65	23
HELIUM	7/3.75	77.3	11.3	212	17.6	65	23
HYDROGEN	7/4.50	111	13.5	304	24.3	65	23
IODINE	7/4.75	124	14.3	339	27.1	65	23
KRYPTON	19/3.25	158	16.3	433	37.4	65	23
LUTETIUM	19/3.50	183	17.5	503	41.7	65	23
NEON	19/3.75	210	18.8	576	47.8	65	23
NITROGEN	37/3.00	262	21.0	721	62.2	64	23
NOBELUM	37/3.25	307	22.8	845	72.8	64	23
OXYGEN	19/4.75	337	23.8	924	73.6	65	23
PHOSPHORUS	37/3.75	409	26.3	1120	93.1	64	23
RHODIUM	61/3.00	431	27.0	1192	97.0	64	23
SELENIUM	61/3.25	506	29.3	1400	114	64	23
SILICON	61/3.50	587	31.5	1620	127	64	23
SULPHUR	61/3.75	674	33.8	1860	145	64	23
XENON	91/4.50	1450	49.5	4010	300	64	23

Electrical characteristics

Product code	Equivalent area		Resistance		Current ratings (Rural weathered)				Current ratings (Industrial)				Geo-metric mean radius mm	Inductive reactance (X_a) to 0.3048m Ω/km
					Winter night		Summer noon		Winter night		Summer noon			
	Copper mm^2	Alum mm^2	D.C. at 20°C /km	A.C. at 75°C /km	Still air Amps	1 m/s wind Amps	Still air Amps	1 m/s wind Amps	Still air Amps	1 m/s wind Amps	Still air Amps	1 m/s wind Amps		
CHLORINE	20.6	32.8	0.864	1.050	122	207	93	185	133	213	87	182	2.72	0.296
CHROMIUM	24.9	39.7	0.713	0.866	139	233	105	208	146	234	98	200	2.99	0.290
FLUORINE	29.6	47.2	0.601	0.731	156	260	117	231	170	268	109	227	3.27	0.285
HELIUM	46.3	73.7	0.383	0.468	211	345	155	304	231	358	142	298	4.08	0.272
HYDROGEN	66.7	106.0	0.266	0.325	270	435	194	380	297	452	176	371	4.90	0.260
IODINE	74.3	118.0	0.239	0.292	290	466	207	405	320	484	188	396	5.17	0.256
KRYPTON	93.9	150.0	0.189	0.231	345	542	240	469	381	565	216	457	6.16	0.245
LUTETIUM	109.0	173.0	0.163	0.198	383	596	265	513	423	622	238	500	6.63	0.241
NEON	125.0	199.0	0.142	0.174	422	651	291	558	467	680	261	543	7.10	0.236
NITROGEN	155.0	248.0	0.114	0.140	494	749	338	638	548	784	301	620	8.06	0.228
NOBELUM	182.0	291.0	0.0973	0.119	553	829	376	703	614	869	334	682	8.73	0.223
OXYGEN	208.0	320.0	0.0884	0.109	591	879	400	744	656	924	354	721	9.00	0.221
PHOSPHORUS	243.0	387.0	0.0731	0.090	677	994	455	836	753	1047	401	808	10.08	0.214
RHODIUM	256.0	408.0	0.0694	0.085	703	1028	471	863	783	1083	415	834	10.42	0.212
SELENIUM	300.0	478.0	0.0592	0.073	788	1138	524	951	877	1202	460	917	11.29	0.207
SILICON	348.0	555.0	0.0511	0.063	874	1250	578	1039	975	1323	506	1001	12.16	0.202
SULPHUR	400.0	637.0	0.0444	0.056	966	1368	635	1131	1078	1449	553	1087	13.03	0.198
XENON	855.0	1632.0	0.0207	0.028	1662	2282	1055	1797	1866	2435	899	1710	19.16	0.174

The cables described in this technical manual are designed to be used for the supply of electrical energy in fixed applications up to the rated voltages at a nominal power frequency between 49Hz and 61Hz.

ACSR/GZ – ALUMINIUM CONDUCTORS, GALVANISED STEEL REINFORCED

Standard sizes to AS/NZS 3607

Physical characteristics

Product code	Strand/wire		Cross sectional area			Nominal O.D. mm	Approximate mass kg/km	Calculated minimum breaking load kN	Calculated final modulus of elasticity GPa	Coefficient of linear expansion /°C x 10^{-6}
	Alum No/mm	Steel No/mm	Alum mm^2	Steel mm^2	Total mm^2					
QUINCE	3/1.75	4/1.75	7.2	9.6	16.8	5.3	96	12.7	136	13.9
RAISIN	3/2.50	4/2.50	14.7	19.6	34.3	7.5	193	24.4	136	13.9
SUPER SULTANA	3/3.00	4/3.00	21.2	28.3	49.5	9.0	280	35.0	136	13.9
SULTANA	4/3.00	3/3.00	28.3	21.2	49.5	9.0	242	28.3	119	15.2
WALNUT	4/3.75	3/3.75	44.2	33.1	77.3	11.3	379	43.9	119	15.2
ALMOND	6/2.50	1/2.50	29.2	4.9	34.4	7.5	119	10.5	83	19.3
APRICOT	6/2.75	1/2.75	35.6	5.9	41.5	8.3	144	12.6	83	19.3
APPLE	6/3.00	1/3.00	42.4	7.1	49.5	9.0	171	14.9	83	19.3
BANANA	6/3.75	1/3.75	66.3	11.0	77.3	11.3	268	22.8	83	19.3
CHERRY	6/4.75	7/1.60	106	14.1	120	14.3	404	33.2	80	19.9
GRAPE	30/2.50	7/2.50	147	34.4	182	17.5	677	63.5	88	18.4
LEMON	30/3.00	7/3.00	212	49.5	262	21.0	973	90.4	88	18.4
LYCHEE	30/3.25	7/3.25	249	58.1	307	22.8	1140	105	88	18.4
LIME	30/3.50	7/3.50	289	67.3	356	24.5	1320	122	88	18.4
MANGO	54/3.00	7/3.00	382	49.5	431	27.0	1440	119	78	19.9
ORANGE	54/3.25	7/3.25	448	58.1	506	29.3	1690	137	78	19.9
OLIVE	54/3.50	7/3.50	519	67.3	587	31.5	1960	159	78	19.9
PAW PAW	54/3.75	19/2.25	596	75.5	672	33.8	2240	178	77	20.0
PEACH	54/4.75	19/2.85	957	121	1078	42.8	3600	284	77	20.0

Electrical characteristics

Product code	Equivalent area		Resistance		Current ratings (Rural weathered)				Current ratings (Industrial)				Geo-metric mean radius mm	Inductive reactance (X_a) to 0.3048m Ω/km
					Winter night		Summer noon		Winter night		Summer noon			
	Copper mm^2	Alum mm^2	D.C. at 20°C /km	A.C. at 75°C /km	Still air Amps	1 m/s wind Amps	Still air Amps	1 m/s wind Amps	Still air Amps	1 m/s wind Amps	Still air Amps	1 m/s wind Amps		
QUINCE	5.50	8.70	3.250	4.050	54	94	43	85	58	87	40	84	0.70	0.382
RAISIN	11.20	17.80	1.590	2.020	87	147	67	132	95	152	62	130	1.00	0.360
SUPER SULTANA	16.10	25.70	1.100	1.430	112	185	84	166	122	192	78	163	1.20	0.348
SULTANA	19.80	31.50	0.897	1.170	122	203	91	180	133	209	85	177	1.50	0.334
WALNUT	30.90	49.20	0.573	0.773	165	269	120	237	180	279	111	232	1.87	0.320
ALMOND	18.20	29.00	0.975	1.270	111	188	85	168	121	194	79	165	2.43	0.303
APRICOT	22.00	35.10	0.805	1.060	125	209	96	189	137	219	89	186	2.68	0.297
APPLE	26.20	41.80	0.677	0.900	140	233	105	207	153	241	98	204	2.92	0.292
BANANA	41.00	65.20	0.433	0.601	189	309	139	272	207	321	127	267	3.65	0.278
CHERRY	65.80	104.70	0.271	0.403	257	411	183	358	283	428	166	350	4.61	0.263
GRAPE	90.40	144.00	0.196	0.240	349	543	242	468	386	568	217	456	7.22	0.235
LEMON	130.20	207.00	0.136	0.167	452	685	309	585	501	719	276	567	8.66	0.224
LYCHEE	153.20	244.00	0.116	0.142	492	758	344	644	562	797	306	624	9.38	0.219
LIME	177.30	282.30	0.100	0.123	563	833	380	704	625	877	336	682	10.11	0.214
MANGO	234.40	373.40	0.0758	0.0967	654	955	438	802	727	1007	386	775	10.93	0.209
ORANGE	275.00	438.00	0.0646	0.0827	732	1058	487	884	816	1117	428	853	11.84	0.204
OLIVE	319.00	508.10	0.0557	0.0716	813	1163	538	967	907	1230	471	931	12.76	0.199
PAW PAW	366.20	583.20	0.0485	0.0628	893	1265	587	1046	997	1341	512	1006	13.67	0.195
PEACH	586.50	934.00	0.0303	0.0408	1248	1714	803	1389	1399	1827	691	1327	17.31	0.180

The cables described in this technical manual are designed to be used for the supply of electrical energy in fixed applications up to the rated voltages at a nominal power frequency between 49Hz and 61Hz.

ACSR/AC – ALUMINIUM CONDUCTORS, ALUMINIUM CLAD STEEL REINFORCED

Standard sizes to AS 3607

Physical characteristics

Product code	Strand/wire		Cross sectional area			Nominal O.D. mm	Approximate mass kg/km	Calculated minimum breaking load kN	Calculated final modulus of elasticity GPa	Coefficient of linear expansion /°C x 10^{-6}
	Alum No/mm	Steel No/mm	Alum mm^2	Steel mm^2	Total mm^2					
SKATING	3/1.75	4/1.75	7.2	9.6	16.8	5.3	83	12.3	119	15.3
SOCCER	3/2.50	4/2.50	14.7	19.6	34.3	7.5	171	24.9	119	15.3
SWIMMING	4/3.00	3/3.00	28.3	21.2	49.5	9.0	218	28.9	106	16.5
TENNIS	4/3.75	3/3.75	44.2	33.1	77.3	11.3	340	42.6	106	16.5
ANGLING	6/2.50	1/2.50	29.5	4.9	34.4	7.5	113	10.6	79	20.1
ARCHERY	6/3.00	1/3.00	42.4	7.1	49.5	9.0	163	15.1	79	20.1
BASEBALL	6/3.75	1/3.75	66.3	11.0	77.3	11.3	254	22.3	79	20.1
BOWLS	6/4.75	7/1.60	106	14.1	120	14.3	385	32.7	76	20.6
CRICKET	30/2.50	7/2.50	147	34.4	182	17.5	636	64.4	82	19.4
DARTS	30/3.00	7/3.00	212	49.5	262	21.0	913	91.6	82	19.4
DICE	30/3.25	7/3.25	249	58.1	307	22.8	1070	106	82	19.4
DIVING	30/3.50	7/3.50	289	67.3	356	24.5	1240	122	82	19.4
GOLF	54/3.00	7/3.00	382	49.5	431	27.0	1380	120	75	20.6
GYMNASTICS	54/3.25	7/3.25	448	58.1	506	29.3	1620	139	75	20.6
HURDLES	54/3.50	7/3.50	519	67.3	587	31.5	1880	159	75	20.6
LACROSSE	54/3.75	19/2.25	596	75.5	672	33.8	2150	180	74	20.7
RUGBY	54/4.75	19/2.85	957	121	1078	42.8	3450	288	74	20.7

Electrical characteristics

Product code	Equivalent area		Resistance		Current ratings (Rural weathered)				Current ratings (Industrial)				Geo-metric mean radius mm	Inductive reactance (X_a) to 0.3048m Ω/km
					Winter night		Summer noon		Winter night		Summer noon			
	Copper mm^2	Alum mm^2	D.C. at 20°C /km	A.C. at 75°C /km	Still air Amps	1 m/s wind Amps	Still air Amps	1 m/s wind Amps	Still air Amps	1 m/s wind Amps	Still air Amps	1 m/s wind Amps		
SKATING	6.50	10.30	2.750	3.350	59	102	46	93	63	105	44	91	0.70	0.382
SOCCER	13.30	21.10	1.340	1.630	95	161	73	144	103	166	68	142	1.00	0.360
SWIMMING	22.00	35.00	0.807	1.050	128	214	96	190	140	221	89	186	1.50	0.334
TENNIS	34.40	54.70	0.517	0.689	171	283	127	249	190	293	117	244	1.87	0.320
ANGLING	19.30	30.70	0.923	1.120	114	193	87	173	124	199	82	170	2.43	0.303
ARCHERY	27.70	44.10	0.641	0.844	144	240	108	213	157	248	100	209	2.92	0.292
BASEBALL	43.30	69.00	0.410	0.555	195	318	142	280	213	330	131	274	3.65	0.278
BOWLS	68.70	109.40	0.259	0.356	262	420	187	366	289	437	170	358	4.61	0.263
CRICKET	97.60	155.40	0.182	0.223	362	563	251	486	401	589	225	473	7.22	0.235
DARTS	140.50	223.80	0.126	0.155	470	712	321	607	521	746	286	590	8.66	0.224
DICE	164.90	262.60	0.108	0.133	525	786	356	667	582	825	317	647	9.38	0.219
DIVING	191.30	304.60	0.0928	0.114	584	865	394	731	649	910	349	708	10.11	0.214
GOLF	244.60	389.60	0.0726	0.0908	668	976	447	820	743	1029	394	792	10.93	0.209
GYMNASTICS	287.10	457.30	0.0619	0.078	748	1081	498	903	833	1141	437	871	11.84	0.204
HURDLES	330.00	530.30	0.0533	0.0678	832	1189	550	988	927	1258	481	952	12.76	0.199
LACROSSE	381.80	608.10	0.0465	0.0598	912	1292	600	1068	1018	1369	523	1027	13.67	0.195
RUGBY	612.60	975.70	0.029	0.040	1276	1752	821	1420	1430	1867	705	1357	17.31	0.180

The cables described in this technical manual are designed to be used for the supply of electrical energy in fixed applications up to the rated voltages at a nominal power frequency between 49Hz and 61Hz.

AACSR/GZ – ALUMINIUM ALLOY CONDUCTORS, GALVANISED STEEL REINFORCED

Standard sizes to AS/NZS 3607

Physical characteristics

Product code	Strand/wire		Cross sectional area			Nominal O.D. mm	Approximate mass kg/km	Calculated minimum breaking load kN	Calculated final modulus of elasticity GPa	Coefficient of linear expansion /°C x 10^{-6}
	Alum No/mm	Steel No/mm	Alum mm^2	Steel mm^2	Total mm^2					
APPLE 1120	6/3.00	1/3.00	42.4	7.1	49.5	9.0	171	18.3	83	19.3
BANANA 1120	6/3.75	1/3.75	66.3	11.0	77.3	11.3	268	27.9	83	19.3
CHERRY 1120	6/4.75	7/1.60	106	14.1	120	14.3	402	40.7	80	19.9
GRAPE 1120	30/2.50	7/2.50	147	34.4	182	17.5	677	74.4	88	18.4
LEMON 1120	30/3.00	7/3.00	212	49.5	262	21.0	973	107	88	18.4
LYCHEE 1120	30/3.25	7/3.25	249	58.1	307	22.8	1140	126	88	18.4
LIME 1120	30/3.50	7/3.50	289	67.3	356	24.5	1320	143	88	18.4
MANGO 1120	54/3.00	7/3.00	382	49.5	431	27.0	1440	149	78	19.9
ORANGE 1120	54/3.25	7/3.25	448	58.1	506	29.3	1690	174	78	19.9
OLIVE 1120	54/3.50	7/3.50	519	67.3	587	31.5	1960	197	78	19.9

Electrical characteristics

Product code	Equivalent area		Resistance		Current ratings (Rural weathered)				Current ratings (Industrial)				Geo-metric mean radius mm	Inductive reactance (X_a) to 0.3048m Ω/km
					Winter night		Summer noon		Winter night		Summer noon			
	Copper mm^2	Alum mm^2	D.C. at 20°C /km	A.C. at 75°C /km	Still air Amps	1 m/s wind Amps	Still air Amps	1 m/s wind Amps	Still air Amps	1 m/s wind Amps	Still air Amps	1 m/s wind Amps		
APPLE 1120	25.40	40.40	0.700	0.928	138	229	103	204	150	237	96	200	2.92	0.292
BANANA 1120	39.70	63.20	0.448	0.620	186	304	136	268	204	315	125	262	3.65	0.278
CHERRY 1120	63.50	101.20	0.279	0.413	253	405	180	353	278	421	163	345	4.61	0.263
GRAPE 1120	87.30	139.10	0.203	0.249	343	533	238	460	379	557	213	448	7.22	0.235
LEMON 1120	126.00	200.00	0.141	0.173	444	673	304	574	492	405	271	557	8.66	0.224
LYCHEE 1120	147.60	235.10	0.120	0.147	514	745	338	633	552	783	300	614	9.38	0.219
LIME 1120	171.20	272.60	0.104	0.128	552	817	372	691	613	860	330	669	10.11	0.214
MANGO 1120	226.40	360.50	0.0784	0.0997	643	939	430	789	715	990	379	762	10.93	0.209
ORANGE 1120	265.70	423.10	0.0669	0.0854	720	1040	479	868	801	1098	420	838	11.84	0.204
OLIVE 1120	308.10	490.70	0.0578	0.0741	799	1142	528	949	890	1208	462	914	12.76	0.199

The cables described in this technical manual are designed to be used for the supply of electrical energy in fixed applications up to the rated voltages at a nominal power frequency between 49Hz and 61Hz.

AACSR/AC – ALUMINIUM ALLOY CONDUCTORS, ALUMINIUM CLAD STEEL REINFORCED

Standard sizes to AS/NZS 3607

Physical characteristics

Product code	Strand/wire		Cross sectional area			Nominal O.D. mm	Approximate mass kg/km	Calculated minimum breaking load kN	Calculated final modulus of elasticity GPa	Coefficient of linear expansion /°C x 10^{-6}
	Alum No/mm	Steel No/mm	Alum mm^2	Steel mm^2	Total mm^2					
ARCHERY 1120	6/3.00	1/3.00	42.4	7.1	49.5	9.0	163	18.4	79	20.1
BASEBALL 1120	6/3.75	1/3.75	66.3	11.0	77.3	11.3	254	27.6	79	20.1
BOWLS 1120	6/4.75	7/1.60	106	14.1	120	14.3	385	40.0	76	20.6
CRICKET 1120	30/2.50	7/2.50	147	34.4	182	17.5	636	75.2	82	19.4
DARTS 1120	30/3.00	7/3.00	212	49.5	262	21.0	913	108	82	19.4
DICE 1120	30/3.25	7/3.25	249	58.1	307	22.8	1070	127	82	19.4
DIVING 1120	30/3.50	7/3.50	289	67.3	356	24.5	1240	143	82	19.4
GOLF 1120	54/3.00	7/3.00	382	49.5	431	27.0	1380	150	75	20.6
GYMNASTICS 1120	54/3.25	7/3.25	448	58.1	506	29.3	1620	176	75	20.6
HURDLES 1120	54/3.50	7/3.50	519	67.3	587	31.5	1880	197	75	20.6

Electrical characteristics

Product code	Equivalent area		Resistance		Current ratings (Rural weathered)				Current ratings (Industrial)				Geo-metric mean radius mm	Inductive reactance (X_a) to 0.3048m Ω/km
					Winter night		Summer noon		Winter night		Summer noon			
	Copper mm^2	Alum mm^2	D.C. at 20°C /km	A.C. at 75°C /km	Still air Amps	1 m/s wind Amps	Still air Amps	1 m/s wind Amps	Still air Amps	1 m/s wind Amps	Still air Amps	1 m/s wind Amps		
ARCHERY 1120	26.80	42.70	0.662	0.833	142	236	106	210	154	244	99	206	2.92	0.292
BASEBALL 1120	41.90	66.70	0.424	0.539	191	313	140	275	209	324	129	270	3.65	0.278
BOWLS 1120	66.40	105.80	0.267	0.346	258	414	184	361	285	431	167	352	4.61	0.263
CRICKET 1120	94.30	150.50	0.188	0.231	357	554	247	478	394	579	222	465	7.22	0.235
DARTS 1120	135.70	216.70	0.130	0.960	463	701	316	598	513	735	282	580	8.66	0.224
DICE 1120	159.70	254.00	0.111	0.137	518	775	352	658	574	814	312	638	9.38	0.219
DIVING 1120	185.20	295.00	0.0961	0.1180	574	850	387	719	722	894	343	696	10.11	0.214
GOLF 1120	236.60	377.00	0.0750	0.0937	657	960	440	807	731	1012	388	779	10.93	0.209
GYMNASTICS 1120	277.70	442.30	0.0639	0.0801	736	1064	490	889	820	1123	430	862	11.84	0.204
HURDLES 1120	322.10	513.00	0.0552	0.0697	817	1169	540	971	911	1236	473	935	12.76	0.199

The cables described in this technical manual are designed to be used for the supply of electrical energy in fixed applications up to the rated voltages at a nominal power frequency between 49Hz and 61Hz.

HDCU – HARD DRAWN COPPER CONDUCTORS

Standard sizes to AS 1746

Physical characteristics

Product code	Strand/wire diameter No/mm	Nominal C.S.A. mm²	Nominal O.D. mm	Approximate Mass kg/km	Calculated minimum breaking load kN	Calculated final modulus of elasticity GPa	Coefficient of linear expansion /°C x 10^{-6}
7100HDCU	7/1.00	5.5	3.00	49.3	2.32	120	17
7125HDCU	7/1.25	8.6	3.75	76.9	3.59	120	17
7175HDCU	7/1.75	17	5.25	151	6.89	120	17
7200HDCU	7/2.00	22	6.00	197	8.89	120	17
7275HDCU	7/2.75	42	8.25	375	16.2	120	17
7350HDCU	7/3.50	67	10.5	607	25.4	120	17
7375HDCU	7/3.75	77.28	11.3	696	28.8	120	17
19175HDCU	19/1.75	46	8.75	413	18.3	118	17
19200HDCU	19/2.00	60	10.0	538	23.6	118	17
19275HDCU	19/2.75	113	13.8	1020	43.1	118	17
19300HDCU	19/3.00	134	15.0	1210	50.8	118	17
37175HDCU	37/1.75	89	12.3	806	35.6	117	17
37225HDCU	37/2.25	147	15.8	1331	57.6	117	17
37250HDCU	37/2.50	182	17.5	1640	70.3	117	17
37275HDCU	37/2.75	220	19.3	1990	83.9	117	17
37300HDCU	37/3.00	262	21.0	2370	98.9	117	17
61275HDCU	61/2.75	362	24.8	3280	138	117	17

Electrical characteristics

Product code	Equivalent area		Resistance		Current ratings (Rural weathered)				Current ratings (Industrial)				Geo-metric mean radius mm	Inductive reactance (X_a) to 0.3048m Ω/km
					Winter night		Summer noon		Winter night		Summer noon			
	Copper mm²	Alum mm²	D.C. at 20°C /km	A.C. at 75°C /km	Still air Amps	1 m/s wind Amps	Still air Amps	1 m/s wind Amps	Still air Amps	1 m/s wind Amps	Still air Amps	1 m/s wind Amps		
7100HDCU	7/1	8.7	3.250	3.930	46	84	38	77	49	86	36	76	1.09	0.354
7125 HDCU	7/1.25	13.6	2.090	2.530	62	111	50	101	67	113	48	100	1.36	0.340
7175 HDCU	7/1.75	26.6	1.060	1.280	98	170	77	154	105	174	73	152	1.90	0.319
7200 HDCU	7/2	34.7	0.815	0.986	117	201	91	181	126	206	86	178	2.18	0.311
7275 HDCU	7/2.75	65.3	0.433	0.524	179	299	135	267	194	309	126	262	2.99	0.291
7350 HDCU	7/3.5	106	0.268	0.325	247	405	182	258	270	419	168	351	3.81	0.275
7375 HDCU	7/3.75	121	0.233	0.283	272	444	200	392	298	460	184	384	4.08	0.271
1917HDCU	19/1.75	71.7	0.395	0.479	191	318	143	283	208	328	133	278	3.31	0.284
19200HDCU	19/2	93.6	0.303	0.367	228	376	169	333	249	389	156	327	3.79	0.276
19275 HDCU	19/2.75	177	0.160	0.194	351	563	251	492	386	586	228	480	5.21	0.256
19300HDCU	19/3	211	0.134	0.163	396	630	280	548	437	656	253	534	5.68	0.250
37175HDCU	37/1.75	139	0.203	0.247	299	485	217	426	328	503	198	416	4.70	0.262
37225HDCU	37/2.25	230	0.123	0.150	422	666	295	578	466	695	266	563	6.05	0.246
37250HDCU	37/2.5	284	0.0996	0.1220	490	762	340	657	542	796	305	640	6.72	0.240
37275HDCU	37/2.75	344	0.0823	0.1010	561	860	386	738	621	900	345	717	7.39	0.234
37300HDCU	37/3	409	0.0691	0.0857	635	961	434	820	703	1008	387	796	8.06	0.228
61275HDCU	61/2.75	566	0.0500	0.0632	799	1182	539	999	888	1244	477	967	9.56	0.218

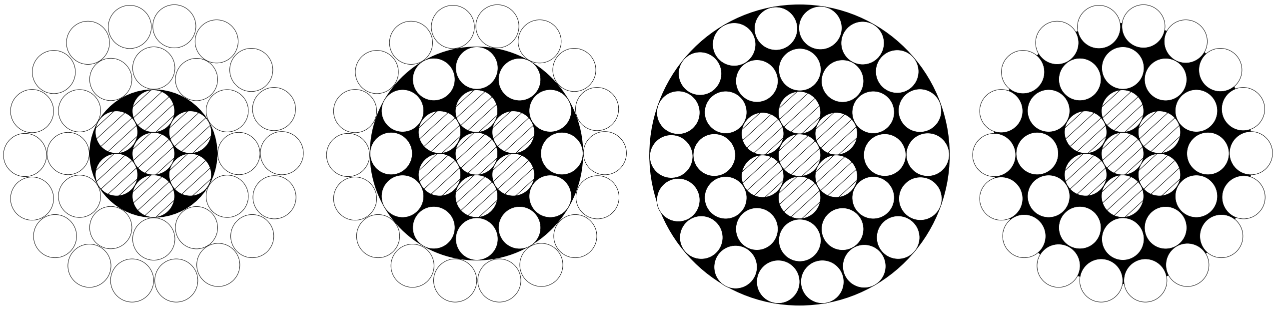
The cables described in this technical manual are designed to be used for the supply of electrical energy in fixed applications up to the rated voltages at a nominal power frequency between 49Hz and 61Hz.

GENERAL & TECHNICAL INFORMATION

General information

CONDUCTOR GREASING

When grease is required for bare conductors to reduce the risk of corrosion, Prysmian has developed a manufacturing application allowing us to calculate and control the required mass of grease following the IEC 61089 Standard. The process eliminates 'grease holidays' and other substandard applications of grease which can lead to advanced corrosion and premature conductor aging, a common conductor ailment known to shave 40% to 50% off the conductor lifespan.



Case 1 Case 2 Case 3 Case 4

Case 1: Steel core only greased.

Case 2: All the conductor is greased except the outer layer.

Case 3: All the conductor is greased including the outer layer.

Case 4: All the conductor is greased except the outer surface of the wires in the outer layer.

OVERHEAD CONDUCTOR STANDARDS

Overhead conductors in common use in Australia follow designs specified in the Australia and New Zealand Standards.

Other existent international standards are US, DIN or IEC standards, all listed in the following table:

Conductor designation	Conductor description	AS/NZS	Related standards			IEC
			UK	US	Europe	
AAC	All aluminium conductor	1531	BS 215-1	ASTM B231	DIN 48201-5	61089 A1
AAAC	All aluminium alloy conductor	1531	BS 3242	ASTM B399	DIN 48201-6	61089 A2/A3
ACSR/GZ	Aluminium conductor, galvanised steel reinforced	3607	BS 215-2	ASTM B232	DIN 48204	61089 A1/S1A
ACSR/AC	Aluminium conductor, aluminium clad steel reinforced	3607	BS 215-2	ASTM B549	DIN 48200-8	
SC/GZ	Galvanised steel conductor	1222-1		ASTM A363		
SC/AC	Aluminium clad steel conductor	1222-2		ASTM B416	DIN 48201-8	
HD copper	Hard drawn copper conductor	1746		ASTM B8	DIN 48201-1	

The ASTM standards are specified in imperial measurements.
The following table gives conversions for the more common units used.

To convert from	Multiply by	AWG	= mm^2
$inch^2$ to mm^2	645.16	4/0	107.2
cmil to mm^2	0.0005067	3/0	85.0
lbf to kN	0.004448	2/0	67.4
Kips to kN	4.448	0	53.2
Tons/sq in to GPa	0.01544	1	42.4
pounds/sq in to MPa	0.0068948	2	33.6
lbs/1000 yd to kg/km	0.49605	3	26.7
lbs/mile to kg/km	0.28185	4	21.1
lbs/1000 yd to kg/km	0.62137	6	13.3

MATERIALS USED IN OVERHEAD CONDUCTORS

Conductor materials used include aluminium, aluminium alloy, galvanised steel, aluminium clad steel and copper. Aluminium wires in all aluminium conductors (AAC) and aluminium conductors steel reinforced (ACSR) are manufactured from high purity electrical grade aluminium. Conductor wires are drawn from continuously cast aluminium rod having extremely uniform physical and electrical properties. Aluminium alloy wires may be used in all aluminium alloy conductors (AAAC) and aluminium alloy conductor steel reinforced (AACSR). The alloy predominantly used in Australia is alloy 1120, which attains greater strength than conventional AAC by controlled additions of copper and magnesium, with only a very small increase in electrical resistivity. International standards specify other aluminium alloys such as alloy 6201, a heat treatable alloy with additions of magnesium and silicon. This material did not attain extensive use and is no longer offered in Australia because of the increased processing costs associated with heat treatment, the greater increase in electrical resistivity compared to alloy 1120 and the lack of practical value for its increased strength in most Australian climatic conditions.

Copper wires used in hard drawn copper conductors are manufactured from electrolytic tough pitch, high conductivity copper. Copper conductors are now rarely used for bare overhead transmission and find their main application as Catenary in railway electrification work. Galvanised steel wires are used in the manufacture of ACSR/GZ and SC/GZ. The wires are made from fully killed steel to AS 1442 and are galvanised by a hot dipping process to give a coating between 200 and 260 g/m^2. Aluminium clad steel wires use the same base steel as galvanised wires, and are used in the manufacture of ACSR/AC and SC/AC. The wires have an aluminium coating of not less than 5% of the wire diameter.

PROPERTIES OF CONDUCTOR MATERIALS

Property	Unit	AAC	AAAC 1120	SC/GZ	SC/AC	HD copper
Conductivity	%IACS	61.0	52.5	10.1	20.3	97.0
Volume resistivity at 20°C	Ω.mm	28.3	32.8	190	84.8	17.77
Density at 20°C	g/cm^3	2.703	2.70	7.8	6.59	8.89
Ultimate tensile strength	MPa	160-190	230-250	1310	1180-1340	405-460
Temp co-efficient of resistance at 20°C	$°C^{-1}$	0.00403	0.00390	0.0044	0.0036	0.00381
Co-efficient of linear expansion at 20°C	$°C^{-1}$	23×10^{-6}	23×10^{-6}	11.5×10^{-6}	12.9×10^{-6}	17×10^{-6}
Modulus of elasticity	GPa	68	68	193	162	124
Specific heat at 20°C	$Jg^{-1}°C^{-1}$	0.9	0.9	0.5	0.5	0.4
Temperature co-efficient of specific heat	$°C^{-1}$	4.5×10^{-4}	4.5×10^{-4}	1.0×10^{-4}	1.0×10^{-4}	2.90×10^{-4}

SELECTION OF CONDUCTOR MATERIAL

Phase conductors

The selection of the optimum material for overhead lines is dictated by the conditions of each installation. Some of these considerations are:

- Required current carrying capacity
- **Length of line:** electrical losses
- **Climatic:** prevailing weather conditions
- **Corrosion:** proximity to sea or polluted atmosphere
- **Physical:** maximum span and tower/pole height

In normal Australian conditions, AAAC 1120 has been the material of choice for the past 20 years for large transmission lines. This is because of all materials available it represents the best compromise between conductor strength, electrical properties and cost. Whilst some materials or combinations of materials are available with higher strength to weight ratios, it is often not practical to use this extra strength to achieve reduced sag because of problems with Aeolian vibration when lines are strung over certain critical tensions. AAC conductors are generally used in situations where the conductor spans are relatively short and thus their lesser strength is not so important. Their greatest application is usually in the smaller power distribution applications. The extra strength offered by ACSR conductors may be needed in situations where a line is being constructed in an area that has extreme climatic conditions. In these situations the extra strength may be required to withstand the heavier conductor loads resulting from cyclonic winds or ice and snow loading. Where no specific information exists on the prevailing climate, specifiers are referred to AS/NZS 7000, which includes details of wind velocity for each region of Australia. ACSR or AACSR may also be preferred if the proposed design includes very long spans between towers. For steel reinforced conductors, the decision to use galvanized or aluminium clad steel is most often dictated by the assessment of the need of the extra corrosion protection offered by aluminium clad wire against its greater cost. Many transmission lines in close proximity to the coast require this extra corrosion resistance if steel is specified, but in drier inland areas, a galvanized reinforced conductor with the steel core suitably protected with high dropping point grease is satisfactory. The higher conductivity of aluminium clad steel means that an ACSR conductor with this material will have a higher current carrying capacity that an otherwise identical conductor with galvanised reinforcement.

Earthwire

Because earthwires are usually required to have less sag than the phase conductors they are normally either ACSR or all steel construction. The size of the earthwire will be dictated by the fault current requirement of the line and/or the level of isoceraunic activity in the area. The choice between galvanised and aluminium clad steel is made under the same criteria as phase conductors though recently, most major lines have specified aluminium clad steel. Many new lines constructed recently have included optical fibre in at least one of the earthwires. This conductor, termed OPGW (Optical groundwire) provides the means for internal line protection, communication and control and also opens up the possibility of an additional revenue stream through leasing of fibre to third parties. OPGW containing from 6 to 144 fibres has been installed in Australia. Because of the need to guarantee a long service life and the high cost of replacement, nearly all OPGWs include aluminium clad steel in their constructions. Because of changing circumstances such as reduced access to microwave frequencies and the possibility of leasing fibre to third parties, some Australian authorities have retrofitted OPGW onto existing transmission lines. All OPGW is currently being produced oversees and most manufacturers produce OPGW to international IEC or IEEE standards. This will normally guarantee compliance to related Australia & New Zealand standards.

Technical information – Mechanical

ERECTION OF CONDUCTORS AND EARTHWIRE

Care should be exercised during erection of conductors to prevent the loosening of strands an the picking up of foreign inclusions such as ground matter between the strands. Extreme looseness can result in the condition known as bird-caging which can be the result of one of the following:

- Inadequate control of tension during unwinding.
- Bending conductor sharply through the use of under diameter sheaves or rollers.
- Unwinding conductor with the tail end of the conductor still firmly attached to the drum.
- Use of an incorrectly reeved tensioner.

Bending radius of bare overhead conductors.

In order to prevent distortion to the wires in each conductor layer and to prevent twisting and loosening of wires, it is recommended that sheave diameters should be not less than 20 times the conductor diameter.

SAGS AND TENSIONS

A conductor strung between two supports will naturally assume a catenary shape. However for most normal spans, the shape is very close to that of a parabola.

Using the parabolic form, the sag in a level span may be expressed as:

$$D = \frac{WL^2}{8T}$$

where:
D = sag (m)
L = span (m)
W = mass/unit length of the conductor (kg/m)
T = conductor tension (kgf)

In arriving at a sag value, two important values are normally considered.

1. Maximum working tension:
This is the maximum tension exerted on the conductor at the time of the most adverse climatic conditions predicted for the installation area e.g. maximum wind plus ice load and minimum temperature. This is normally taken at 50% of the conductor breaking load (CBL).

2. Everyday tension:
This is the condition that the conductor will be expected to be under for the majority of time and is generally nominated as a conductor tension at a specified temperature. E.g. 20% of CBL at 25°C. This is referred to as the everyday tension (EDT).

The every day tension should be set so that under the expected worst climatic conditions, the maximum working tension is not exceeded at any time during the conductors installed life.

The maximum sag will occur when the conductor is operating at its maximum operating temperature (normally 75°C). This condition will be that of minimum ground clearance. Many commercial programmes are now available to perform sag tension calculations. However, the accuracy in these programmes is dependant on the accuracy of the conductor physical parameters which must be supplied to the calculations to be made. Information to be input will include conductor breaking load, 10 year creep, modulus of elasticity and coefficient of thermal expansion.

A detailed analysis of sag and tension calculations may be found in Appendix S of AS/NZS 7000.

CONDUCTOR CREEP

Metallurgical creep occurs in all overhead conductors. Over a period of time this results in slightly increased conductor sag.

The effects of creep can be minimised by pre stressing the conductor. This involves over tensioning the conductor for a short period of time before the final sagging operations are carried out. The initial high tension will remove a large proportion of the creep, minimising the amount which later occurs in the life of the conductor.

MODULUS OF ELASTICITY

The modulus of elasticity of an overhead conductor is dependant on the conductor material plus the construction and conditions of manufacture. The modulus is another parameter which must be quantified if accurate sag tension predictions are to be made. Unless stated otherwise on a specific table, the values for modulus in this catalogue are based on the calculated modulus which is normally slightly higher than the actually measured value.

CONDUCTOR TESTING

In its New Zealand plant, Prysmian maintains fully equipped testing facilities capable of testing full conductor breaking load, modulus of elasticity and co-efficient of thermal expansion. Prysmian can also perform creep tests at both room and elevated temperature which will provide the customer with 10 year creep values.

Technical information – Electrical

CALCULATION OF CONDUCTOR ELECTRICAL PROPERTIES

Equivalent aluminium area:
This term denotes the area of a solid aluminium rod having the same resistance as the stranded conductor. For a homogenous conductor this is obtained by multiplying the area of one wire by that conductor's stranding constant and then by the ratio of the resistivity of aluminium to that of the conductor material. For aluminium clad steel reinforced conductors, the equivalent aluminium area of each component is calculated and then added together. For construction which are galvanized steel reinforced the steel component is ignored.

Mass:
A similar technique is used to calculate conductor mass, whereby a mass constant which includes allowances for material density as well as wire over length is used. The area of one wire is simply multiplied by the mass constant for a homogenous conductor.

DC resistance:
The resistance is obtained by multiplying the resistance of a single wire by the appropriate resistance constant. For aluminium clad steel reinforced conductor the resistance is calculated by summing in parallel the resistances of the aluminium and steel components.

e.g. $\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2}$

For galvanised steel reinforced conductor the contribution of the steel wires is not considered.

A.C. resistance:
The alternating current resistance is greater than the direct current resistance because of:

1. Skin effect:
With alternating current, there is a greater proportion of current flowing in the surface layers of the conductor than in the conductor body. This results in an increase in conductor resistance.

2. Magnetic effect of steel core:
In ACSR conductor, the spiralling effect of the current in the aluminium later gives rise to axial magnetic fields which lead to power losses in the steel core. With conductors having an even number of aluminium layers the magnetic effects of each layer tend to cancel and the effect is negligible. However, with an odd number of layers, the effect can be considerable.

The AC resistance figures in the data tables have been corrected for skin effect and core magnetization. It is necessary to determine the AC resistance of a conductor to accurately calculate its current rating.

CURRENT RATINGS

Factors affecting current rating of overhead conductors:

1. Emissivity:
The standard value for bright new conductor is taken as 0.3. After weathering, the emissivity increases up to a maximum value of 0.5 for a rural weathering and 0.8 in an industrial/polluted environment. Small changes in Emissivity have little effect on current rating.

2. Ambient temperature:
The standard generally adopted for Australia is 35°C for summer noon conditions, leaving a 40°C temperature rise for the purposes of summer current rating calculation. Similarly 10°C is used for winter night conditions (ie 65°C maximum temperature rise).

3. Absorbance:
The standard value for a bright conductor is 0.6. Weathering will reduce this value to 0.5 for a rural environment with a corresponding increase in current rating.

4. Solar radiation:
The solar radiation intensity changes with the altitude of the sun and the clearness of the sky. A value of 1000 W/m^2 is taken as the standard for direct solar radiation and 100 W/m^2 for diffuse solar radiation for summer noon conditions as being appropriate for general conditions throughout Australia.

5. Wind angle:
Ratings are generally based on the wind being at right angles to the phase conductors. Current ratings are reduced by over 30% if the wind is blowing along the axis of the conductor.

6. Wind velocity:
A minimum current rating occurs with zero wind speed and heat losses occurring by convection only. Current carrying capacities have been provided for the theoretical extreme condition of still air and for wind speeds of 1.0 m/s. Current ratings are substantially increased at higher wind velocities.

The current ratings quoted in this catalogue have been calculated according the method described in the ESAA publication D(b)5-1988. The standard conditions adopted are as follows:

	Summer day	Winter night
Air temperature	35°C	10°C
Temperature rise	40°C	40°C
Emissivity – Rural weathered condition – Industrial weathered condition	 0.5 0.85	 0.5 0.85
Absorbance – Rural weathered condition – Industrial weathered condition	 0.5 0.85	 - –
Direct solar radiation intensity	1000 W/m^2	Nil
Diffuse solar radiation intensity	100 W/m^2	Nil
Wind speed	still (0m/s) & 1m/s	
Ground reflectance (Albedo)	0.2	0.2
Angle of wind	90°	90°

GEOMETRIC MEAN RADIUS

The GMR represents the radius of an infinitely thin tube having the same inductance under the same current loading as the conductor.

The GMR is expressed as:
$GMR = 0.5 \times D \times K_g$

Where:
GMR = geometric mean radius (m)
D = overall conductor diameter (m)
K_g = layer factor

The layer factor depends on the type of conductor and layer geometry. The layer factor for single layer ACSR conductors varies with conductor size and current loading and must be experimentally determined.

Conductor stranding	Layer factor (K_g)
ACSR conductors	
6/1, 4/3, 3/4	Varies
22/7	0.7949
26/7	0.8116
30/7	0.8250
45/7	0.7939
54/7	0.8099
54/19	0.8099
All aluminium conductors	
7W	0.7256
19W	0.7577
37W	0.7678
61W	0.7722
91W	0.7743

VOLTAGE DROP

Approximate voltage drop may be calculated from the impedance of the transmission line.

$Z = \sqrt{(R^2 \times X^2)}$

Where:
Z = impedance (ohm/km)
R = AC resistance (ohm/km)
X = total inductive reactance (ohm/km)

and

$V = I \times Z$

Where:
V = voltage drop (volts/km)
I = current (amps)

Because the total inductive reactance (X) component of the above formula is dependant on line design, subsequently no figures for voltage drop are published in this catalogue.

INDUCTIVE REACTANCE (X)

The inductive reactance of a conductor is calculated using the concepts of geometric mean radius (GMR) and geometric mean distance (GMD). Whilst no energy loss is directly related to inductive reactance, a slight increase in the I^2R loss occurs in the conductors because of it.

The total inductive reactance (X) is the sum of:

$X_a + X_d$ where:
X_a = Inductive reactance due to both the internal magnetic flux and that external to the conductor to a nominated radius.

$$X_a = 0.1736 \left[\frac{f}{60}\right] \log \left[\frac{a}{GMR}\right] \text{ ohm/km}$$

Where:
a = nominated radius, normally 0.3048 metre (1 foot)
GMR = geometric mean radius (m)
X_a = inductive reactance (ohm/km)
f = frequency (Hz)

and

X_d = Inductive reactance due to both the magnetic flux surrounding the conductor from the nominated radius out to the equivalent return conductor.

$$X_d = 0.1736 \left[\frac{f}{60}\right] \log \left[\frac{GMD}{a}\right] \text{ ohm/km}$$

Where:
GMD = geometric mean distance (m)
For a 3 phase transmission line:
$GMD = \sqrt[3]{(d_1 \times d_2 \times d_3)}$
where d_1, d_2 and d_3 are conductor separations (m)

As the inductive reactance resulting from the equivalent return conductor (X_d) is dependant on line design, the data sheets included in this catalogue only quote the inductive reactance from magnetic flux (X_a) to a 0.3048 metre (1 foot) radius Where inductive reactance and GMR are nominated for a single layer ACSR conductor, the values are based on those published by the Aluminium Association and maybe considered as accurate to 3%.

Referenced documents

AS/NZS 1531 -1991	Conductors – Bare Overhead – Aluminium And Aluminium Alloy
AS/NZS 3607 - 1989	Conductors – Bare Overhead. Aluminium And Aluminium Alloy – Steel Reinforced
AS/NZS 1746 - 1991	Conductors – Bare Overhead – Hard-Drawn Copper
AS/NZS 1222.1 - 1992	Steel Conductors And Stays – Bare Overhead Part 1: Galvanized (SC/GZ)
AS/NZS 1222.2 - 1992	Steel conductors And Stays – Bare Overhead Part 2: Aluminium Clad (SC/AC)
AS/NZS 7000	Overhead Line Design – Detailed Procedures
IEC 61597 - 1995 - 2005	Overhead Electrical Conductors – Calculation Methods For Stranded Bare Conductors
IEEE STD 524 - 2003	IEEE guide to the installation of overhead transmission line conductors Aluminium Electrical Conductor Handbook, The Aluminium Association, 1971

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Prysmian Australia Pty Ltd

1 Heathcote Road, Liverpool 2170 NSW, Australia
Ph: 1300 300 304   Fx: 1300 300 307
E-mail: sales.au@prysmiangroup.com

www.prysmiancable.com.au

Prysmian New Zealand Ltd

30 Binsted Road, New Lynn 0640 Auckland, New Zealand
Ph: (09) 827 3109   Toll Free: 0800 492 225
E-mail: sales.nz@prysmiangroup.com

www.prysmiancable.co.nz

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