

Rochester Gas and Electric Corporation
ROCHESTER AREA RELIABILITY PROJECT
PSC Case No. 11-T-0534
Information Request

Requesting Party and No.: Staff of the Department of Public Service (DPS-4)

RG&E Response No.: RARP-12-005

Request Date: February 28, 2012

Information Requested of: RG&E

RE: Catalog Cutsheets

Reply Date: March 14, 2012

Respondent: Kurt Doern Jr.

QUESTION:

- 1) Provide the underground cable manufacturers catalog cutsheet.
- 2) Provide the overhead cable manufacturers catalog cutsheet.
- 3) Provide the shield wire manufacturers catalog cutsheet.
- 4) Provide the catalog cutsheets for the steel poles, for the 115 kV bus, and brace post insulators.

RESPONSE:

- 1) See RARP-12-005 Attachment A.
- 2) See RARP-12-005 Attachment B.
- 3) See RARP-12-005 Attachment C.
- 4) See RARP-12-005 Attachment D.

These cutsheets are examples from approved suppliers of the types of product to be used. RG&E will not necessarily use these specific suppliers.



Quick Jump

[Power Cables > High Voltage Cable](#)

138kV Shielded (SPS) 90°C Rating

Related Products

Medium Voltage

5kV 15kV 25kV 35kV

PILC Network Replacement

High Voltage

46kV 69kV 115kV 138kV

Conductor – Copper Strand

Conductor Shield – Non-Conducting Permashield®

Stress Control Layer

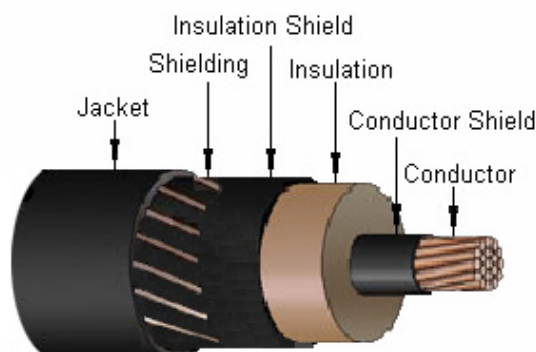
Insulation – Discharge Resistant EPR Insulation

Insulation Shield – Thermosetting Semi-

Conducting Semi-Conducting Layer

Shielding – Flat Strap Copper Concentric Neutrals

Jacket – Polyethylene (PE)



Catalog Numbers

Catalog Number Suffix = JH100 850 mil Insulation						
Catalog Number Prefix	Size (AWG/kcmil)	Number of Strands	O.D. Over Insulation (inches)	Jacket		Cable Weight (lbs/kft)
				Thickness (mils)	O.D. (inches)	
150C98-	500	37	2.579	140	3.059	5.221
175C98-	750	61	2.768	140	3.248	6.342
190C98-	1000	61	2.917	140	3.397	7.384
192C98-	1250	91	3.075	140	3.555	8.463
195C98-	1500	91	3.195	140	3.675	9.455
197C98-	1750	127	3.311	140	3.791	10.444
199C98-	2000	127	3.414	140	3.894	11.405

Cable shield (15 #12 AWG Wires) designed to carry 26kA for 6 cycles = 22kA for 8 cycles = 20kA for 10 cycles.

Consult factory for custom shield designs.

AC Final Testing Voltage – 140kV for Thirty Minutes



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A Marmon Wire & Cable/Berkshire Hathaway Company



APPLICATIONS

Used as bare overhead transmission cable and as primary and secondary distribution cable. ACSR offers optimal strength for line design. Variable steel core stranding enables desired strength to be achieved without sacrificing ampacity.

SPECIFICATIONS

Southwire's ACSR bare conductor meets or exceeds the following ASTM specifications:

- B-230 Aluminum Wire, 1350-H19 for Electrical Purposes
- B-231 Aluminum Conductors, Concentric-Lay-Stranded
- B-232 Aluminum Conductors, Concentric-Lay-Stranded, Coated Steel Reinforced (ACSR)
- B-341 Aluminum-Coated Steel Core Wire for Aluminum Conductors, Steel Reinforced (ACSR/AZ)
- B-498 Zinc-Coated Steel Core Wire for Aluminum Conductors, Steel Reinforced (ACSR)
- B-802 Zinc-5% Aluminum-Mischmetal Alloy-Coated Steel Core Wire for Aluminum Conductors, Steel Reinforced (ACSR)

CONSTRUCTION

Aluminum alloy 1350-H19 wires, concentrically stranded about a steel core. Core wire for ACSR is available with class A, B, or C galvanizing; "aluminized" aluminum coated (AZ); or aluminum-clad (AW). Additional corrosion protection is available through the application of grease to the core or infusion of the complete cable with grease.

¹ For aluminum-clad ACSR (ACSR/AW), see Catalog Section for ACSR/AW.

Code Word	Size (AWG or kcmil)	Strand- ing (Al/Stl)	Diameter (ins.)				Weight Per 1000 ft. (lbs.)			Content (%)		Rated Strength (lbs.)	Resistance OHMS/1000 ft.		Allowable Ampacity+ (Amps)
			Individual Wires		Steel Core	Complete Cable	Al	Stl	Total	Al	Stl		DC @ 20°C	AC @ 75°C	
			Al	Stl											
Turkey	6	6/1	.0661	.0661	.0661	.198	24	12	36	67.88	32.12	1190	.641	.806	105
Swan	4	6/1	.0834	.0834	.0834	.25	39	18	57	67.87	32.12	1860	.403	.515	140
Swanate	4	7/1	.0772	.103	.103	.257	39	28	67	58.1	41.9	2360	.399	.519	140
Sparrow	2	6/1	.1052	.1052	.1052	.316	62	29	91	67.9	32.1	2850	.254	.332	184
Sparate	2	7/1	.0974	.1298	.1298	.325	62	45	107	58.12	41.88	3460	.251	.338	184
Robin	1	6/1	.1181	.1181	.1181	.354	78	37	115	67.88	32.12	3550	.201	.268	212
Raven	1/0	6/1	.1327	.1327	.1327	.398	99	47	145	67.89	32.11	4380	.159	.217	242
Quail	2/0	6/1	.1489	.1489	.1489	.447	124	59	183	67.88	32.12	5310	.126	.176	276
Pigeon	3/0	6/1	.1672	.1672	.1672	.502	156	74	230	67.87	32.13	6620	.100	.144	315
Penguin	4/0	6/1	.1878	.1878	.1878	.563	197	93	291	67.89	32.12	8350	.0795	.119	357
Waxwing	266.8	18/1	.1217	.1217	.1217	.609	250	39	289	86.43	13.57	6880	.0643	.0787	449
Partridge	266.8	26/7	.1013	.0788	.2363	.642	251	115	367	68.51	31.49	11300	.0637	.0779	475
Ostrich	300	26/7	.1074	.0835	.2506	.68	283	130	412	68.51	31.49	12700	.0567	.0693	492
Merlin	336.4	18/1	.1367	.1367	.1367	.684	315	49	365	86.43	13.57	8680	.0510	.0625	519
Linnet	336.4	26/7	.1137	.0885	.2654	.72	317	146	462	68.51	31.49	14100	.0505	.0618	529
Oriole	336.4	30/7	.1059	.1059	.3177	.741	318	209	526	60.35	39.65	17300	.0502	.0613	535
Chickadee	397.5	18/1	.1486	.1486	.1486	.743	373	58	431	86.43	13.57	9940	.0432	.0529	576
Brant	397.5	24/7	.1287	.0858	.2574	.772	374	137	511	73.21	26.79	14600	.0430	.0526	584
Ibis	397.5	26/7	.1236	.0962	.2885	.783	374	172	546	68.51	31.49	16300	.0428	.0523	587
Lark	397.5	30/7	.1151	.1151	.3453	.806	375	247	622	60.35	39.65	20300	.0425	.0519	594
Pelican	477	18/1	.1628	.1628	.1628	.814	447	70	517	86.44	13.56	11800	.0360	.0442	646
Flicker	477	24/7	.141	.094	.2819	.846	449	164	614	73.21	26.79	17200	.0358	.0439	655
Hawk	477	26/7	.1354	.1053	.316	.858	449	207	656	68.51	31.49	19500	.0356	.0436	659
Hen	477	30/7	.1261	.1261	.3783	.883	450	296	746	60.35	39.65	23800	.0354	.0433	666
Osprey	556.5	18/1	.1758	.1758	.1758	.879	522	82	603	86.43	13.57	13700	.0308	.0379	711
Parakeet	556.5	24/7	.1523	.1015	.3045	.914	524	192	716	73.21	26.79	19800	.0307	.0376	721
Dove	556.5	26/7	.1463	.1138	.3413	.927	524	241	765	68.51	31.49	22600	.0306	.0375	726
Eagle	556.5	30/7	.1362	.1362	.4086	.953	525	345	871	60.35	39.65	27800	.0303	.0372	734
Peacock	605	24/7	.1588	.1059	.3177	.953	570	209	779	73.2	26.8	21600	.0282	.0346	760
Squab	605	26/7	.1525	.1186	.3559	.966	570	262	832	68.51	31.49	24300	.0281	.0345	765
Wood Duck	605.0	30/7	.142	.142	.426	.994	571	375	946	60.35	39.65	28900	.0279	.0342	774
Teal	605.0	30/19	.142	.0852	.426	.994	571	367	939	60.86	39.14	30000	.0279	.0342	773
Kingbird	636	18/1	.188	.188	.188	.94	596	94	690	86.43	13.57	15700	.0270	.0332	773
Swift	636.0	36/1	.1329	.1329	.1329	.93	596	47	643	92.72	7.28	13690	.0271	.0334	769
Rook	636	24/7	.1628	.1085	.3256	.977	599	219	818	73.22	26.78	22600	.0268	.0330	784
Grosbeak	636	26/7	.1564	.1216	.3649	.991	599	275	874	68.51	31.49	25200	.0267	.0328	789

Scoter	636.0	30/7	.1456	.1456	.4368	1.019	600	395	995	60.35	39.65	30400	.0256	.0325	798
Egret	636	30/19	.1456	.0874	.4368	1.019	600	386	987	60.85	39.15	31500	.0266	.0326	798
Flamingo	666.6	24/7	.1667	.1111	.3333	1	628	230	858	73.21	26.79	23700	.0256	.0315	807
Gannet	666.6	26/7	.1601	.1245	.3736	1.014	628	289	916	68.51	31.49	26400	.0255	.0313	812
Stilt	715.5	24/7	.1727	.1151	.3453	1.036	674	247	920	73.21	26.79	25500	.0239	.0294	844
Starling	715.5	26/7	.1659	.129	.3871	1.051	674	310	984	68.51	31.49	28400	.0238	.0292	849
Redwing	715.5	30/19	.1544	.0927	.4633	1.081	676	435	1110	60.85	39.15	34600	.0236	.0290	859
Coot	795	36/1	.1486	.1486	.1486	1.04	745	58	804	92.72	7.28	16710	.0217	.0268	884
Drake	795	26/7	.1749	.136	.408	1.107	749	344	1093	68.51	31.49	31500	.0214	.0263	907
Tern	795	45/7	.1329	.0886	.2658	1.063	749	146	895	83.67	16.33	22100	.0216	.0269	887
Condor	795	54/7	.1213	.1213	.364	1.092	749	274	1023	73.21	26.79	28200	.0215	.0272	889
Mallard	795	30/19	.1628	.0977	.4884	1.14	751	483	1234	60.86	39.14	38400	.0213	.0261	918
Ruddy	900	45/7	.1414	.0943	.2828	1.131	848	165	1013	83.67	16.33	24400	.0191	.0239	958
Canary	900	54/7	.1291	.1291	.3873	1.162	848	310	1158	73.22	26.78	31900	.0190	.0241	961
Rail	954	45/7	.1456	.0971	.2912	1.165	899	175	1074	83.67	16.33	25900	.0180	.0225	993
Cardinal	954	54/7	.1329	.1329	.3987	1.196	899	329	1227	73.21	26.79	33800	.0179	.0228	996
Ortolan	1033.5	45/7	.1515	.101	.3031	1.212	973	190	1163	83.67	16.33	27700	.0167	.0209	1043
Curlew	1033.5	54/7	.1383	.1383	.415	1.245	973	356	1330	73.21	26.79	36600	.0165	.0211	1047
Bluejay	1113	45/7	.1573	.1048	.3145	1.258	1048	205	1253	83.67	16.33	29800	.0155	.0194	1092
Finch	1113	54/19	.1436	.0861	.4307	1.292	1053	375	1429	73.72	26.28	39100	.0154	.0197	1093
Bunting	1192.5	45/7	.1628	.1085	.3256	1.302	1123	219	1343	83.67	16.33	32000	.0144	.0182	1139
Grackle	1192.5	54/19	.1486	.0892	.4458	1.337	1129	402	1531	73.72	26.28	41900	.0144	.0184	1140
Bittern	1272	45/7	.1681	.1121	.3362	1.345	1198	234	1432	83.67	16.33	34100	.0135	.0171	1184
Pheasant	1272	54/19	.1535	.0921	.4605	1.381	1204	429	1633	73.71	26.29	43600	.0135	.0173	1187
Dipper	1351.5	45/7	.1733	.1155	.3466	1.386	1273	248	1521	83.67	16.33	36200	.0127	.0162	1229
Martin	1351.5	54/19	.1582	.0949	.4746	1.424	1279	456	1735	73.72	26.28	46300	.0127	.0163	1232
Bobolink	1431	45/7	.1783	.1189	.3566	1.427	1348	263	1611	83.67	16.33	38300	.0120	.0153	1272
Lapwing	1590	45/7	.188	.1253	.3759	1.504	1498	292	1790	83.67	16.33	42200	.0108	.0139	1354
Falcon	1590	54/19	.1716	.103	.5148	1.544	1505	536	2041	73.72	26.28	54500	.0108	.0140	1359
Chukar	1780	84/19	.1456	.0874	.4368	1.602	1685	386	2072	81.35	18.65	51000	.0097	.0125	1453
Bluebird	2156	84/19	.1602	.0962	.4808	1.762	2040	468	2508	81.34	18.66	60300	.00801	.0105	1623
Kiwi	2167	72/7	.1735	.1157	.347	1.735	2051	249	2300	89.17	10.82	49800	.00801	.0106	1607

+Conductor temperature of 75°C, ambient temperature 25°C, emissivity 0.5, wind 2 ft./sec., in sun.

Code Word	Size (AWG or kcmil)	Stranding (Al/Stl)	Diameter (ins.)				Weight Per 1000 ft. (lbs.)			Content (%)		Rated Strength (lbs.)	Resistance OHMS/1000 ft.		Allowable Ampacity ⁺ (Amps)
			Individual Wires		Steel Core	Complete Cable	Al	Stl	Total	Al	Stl		DC @ 20°C	AC @ 75°C	
			Al	Stl											
HIGH MECHANICAL STRENGTH															
Grouse	80	8/1	.1	.1667	.1667	.367	75	74	149	50.48	49.52	5200	.207	.294	204
Petrel	101.8	12/7	.0921	.0921	.2763	.461	96	158	254	37.79	62.21	10400	.158	.250	237
Minorca	110.8	12/7	.0961	.0962	.2885	.481	104	172	276	37.75	62.25	11300	.145	.235	248
Leghorn	134.6	12/7	.1059	.1059	.3177	.53	127	209	335	37.79	62.21	13600	.120	.204	273
Guinea	159.0	12/7	.1151	.1151	.3453	.576	150	247	396	37.79	62.21	16000	.101	.181	297
Dotterel	176.9	12/7	.1214	.1214	.3642	.607	167	274	441	37.79	62.21	17300	.0911	.169	312
Dorking	190.8	12/7	.1261	.1261	.3783	.63	180	296	476	37.78	62.22	18700	.0845	.160	324
Cochin	211.3	12/7	.1327	.1327	.398	.663	199	328	527	37.8	62.2	28400	.0763	.150	340
+Conductor temperature of 75°C, ambient temperature 25°C, emissivity 0.5, wind 2 ft./sec., in sun.															

TABLE 1-43
HIGH-STRENGTH, UTILITIES GRADE, AND EXTRA-HIGH-STRENGTH STEEL CONDUCTORS

Size in	Stranding	Area Sq. in	Diameter		Weight lbs/1000 ft	Rated Strength lbs	Resistance					Reactance @ 1 ft Spacing, 60 Hz				
			Strand in	Complete Cable in			dc 20°C Ω/mile	ac-60 Hz				Inductive, X _a				Capacitive X' _a MΩ-mile
								10 Amps Ω/mile	40 Amps Ω/mile	70 Amps Ω/mile	100 Amps Ω/mile	10 Amps Ω/mile	40 Amps Ω/mile	70 Amps Ω/mile	100 Amps Ω/mile	
High-Strength Steel-Class A Galvanizing (1)																
5/8"	7	0.2356	0.207	0.621	813	29,600	2.15	2.22	2.27	2.44	2.60	0.97	1.12	1.26	1.39	0.1083
1/2"	7	0.1497	0.165	0.495	517	18,800	3.38	3.48	3.57	3.84	4.08	1.01	1.24	1.44	1.63	0.1150
7/16"	7	0.1156	0.145	0.435	399	14,500	4.38	4.51	4.62	4.97	5.28	1.04	1.33	1.58	1.81	0.1188
3/8"	7	0.0792	0.120	0.360	273	10,800	6.40	6.59	6.75	7.26	7.71	1.10	1.50	1.84	2.15	0.1244
Utilities Grade Steel (1) (2)																
7/16"	7	0.1156	0.145	0.435	399	18,000	4.53	4.66	4.74	5.01	5.36	1.00	1.28	1.52	1.74	0.1188
3/8"	7	0.0792	0.120	0.360	273	11,500	6.40	6.59	6.75	7.26	7.71	1.10	1.50	1.84	2.15	0.1244
Extra-High-Strength Steel-Class A Galvanizing (1)																
5/8"	7	0.2356	0.207	0.621	813	42,400	2.22	2.28	2.32	2.46	2.62	0.93	1.08	1.21	1.35	0.1083
1/2"	7	0.1497	0.165	0.495	517	26,900	3.50	3.60	3.66	3.87	4.13	0.98	1.20	1.39	1.57	0.1150
7/16"	7	0.1156	0.145	0.435	399	20,800	4.53	4.66	4.74	5.01	5.36	1.00	1.28	1.52	1.74	0.1188
3/8"	7	0.0792	0.120	0.360	273	15,400	6.63	6.81	6.93	7.33	7.83	1.06	1.44	1.77	2.07	0.1244
Extra-High-Strength Steel-Class C Galvanizing (1)																
7/16"	7	0.1156	0.145	0.435	399	20,800	—	3.68	3.69	3.73	3.77	0.83	0.85	0.89	0.95	0.1188
3/8"	7	0.0792	0.120	0.360	273	15,400	—	5.42	5.43	5.45	5.51	0.82	0.84	0.88	0.93	0.1244
5/16"	7	0.0595	0.104	0.312	205	11,200	—	6.84	6.84	6.87	6.89	0.85	0.87	0.94	1.04	0.1287

Notes: (1) Data based on a nominal cable manufactured in accordance with ASTM A 363 and ASTM A 475.

(2) Data accumulated by EPRI, and published in "The EPRI Transmission Line Reference Book - 345 KV and Above / Second Edition."

(3) — Data not available.


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Sabre Tubular Structure

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Sabre Tubular Structures, the tubular steel pole division of Sabre Industries, Inc., designs and manufactures a full line of tubular steel poles used in transmission and distribution applications, substation applications, and sports and high mast lighting. Our professional staff is comprised of recognized leaders in the steel pole industry, providing you with the best in engineering, fabrication, quality control and project management.

Committed to Exceeding Your Expectations

- Sabre Tubular Structures has the capacity necessary to meet your demands. Our new pole manufacturing facility located in Alvarado, Texas, has 200,000 square feet of production space situated on 147 acres.
- Dedicated to the manufacture of tubular polygonal sections, our new state-of-the-art facility offers the most streamlined and efficient manufacturing in the pole industry. In-house capabilities include an arm fabrication shop, blasting facility, climate-controlled paint facility, and the largest hot dip galvanizer of its type in North America.
- We can provide a solution for every need – manufacturing a full line of steel transmission and distribution structures, including single pole, H-Frames, 3-pole structures and specialty structures such as riser and switch structures.
- Sabre Tubular Structures provides a variety of substation structures, from static masts to 500kV A-Frame structures.
- Our light duty line of standard class poles are designed to satisfy the needs of cooperatives and investor-owned utilities that require a "wood pole equivalent" structure.
- Committed to exceeding your expectations on every opportunity, we provide complete engineering design packages and drawings in either electronic or hard copy format depending on your needs.

From proposal preparation to final delivery, Sabre Tubular Structures is dedicated to being your full service project partner. Our team is committed to exceeding your expectations on every opportunity.

To learn more about Sabre Tubular Structures or to request a quotation for your steel utility pole project, contact us at (866) 254-3707 or utilityinfo@sabreindustries.com.



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Sabre Tubular Structures, the steel pole division of Sabre Industries, Inc., designs and manufactures tubular steel poles used in power [transmission & distribution](#) applications, [substation](#) applications, and sports and high mast [lighting](#).

Sabre Tubular Structures • 8653 E. Highway 67 • Alvarado, TX 76009
Toll Free: 866-254-3707 • Fax: 817-852-1703 • Email: utilityinfo@sabreindustries.com

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Sabre Standard Pole Designs

Designed for RUS Standard Pole Requirements

Pole Length: **120** Feet
 Embedded Depth: **10 %** plus **2** feet
 14 Feet

GROUND LINE DATA
 Above Ground Height **106** feet

FIXITY POINT
 Below Ground Line **0** feet

NEAR POLE TOP
 Pole Top Down **5** feet

Catalog Prefix (WPE Equiv)	X- Sec	Top Dia. [Flat-Flat]	Taper	Plate	Load (lbs)	Bottom Dia.	GL Dia. (inches)	GLM Capacity (ft-kips)	Req'd GLM (ft-kips)	Fixity Diameter	Moment Capacity (ft-kips)	Near Pole Top Diameter	Moment Capacity (ft-kips)
STS - H9	12	10.7460	0.22950	0.2500	10,500	37.29	34.08	1190	1092	34.08	1190	11.89	148
STS - H8	12	10.2630	0.21540	0.2500	9,400	35.11	32.09	1090	978	32.09	1090	11.34	134
STS - H7	12	10.2630	0.19415	0.2500	8,200	32.56	29.84	968	853	29.84	968	11.23	131
STS - H6	12	10.2630	0.17153	0.2500	7,125	29.85	27.45	817	741	27.45	817	11.12	129
STS - H5	12	10.2026	0.15500	0.2500	6,250	27.80	25.63	711	650	25.63	711	10.98	126
STS - H4	12	10.1422	0.17870	0.1875	5,438	30.84	28.34	579	566	28.34	579	11.04	97
STS - H3	12	10.1422	0.15067	0.1875	4,688	27.47	25.36	496	488	25.36	496	10.90	94
STS - H2	12	9.1763	0.14247	0.1875	4,000	25.52	23.53	444	416	23.53	444	9.89	77
STS - H1	12	9.1763	0.12074	0.1875	3,375	22.92	21.23	367	351	21.23	367	9.78	76
STS - C1	12	9.1763	0.10142	0.1875	2,813	20.60	19.18	299	293	19.18	299	9.68	74
STS - C2	8	8.2100	0.10500	0.1875	2,313	20.06	18.59	266	241	18.59	266	8.74	63
STS - C3	8	8.2100	0.10500	0.1875	1,875	20.06	18.59	266	195	18.59	266	8.74	63

Design Notes:

Up to 60'; All poles are single piece.
 65' to 90'; All poles are 2-piece with standard 47'-6" top section
 95' to 115'; All poles are 2-piece with standard 60'-0" top section
 120' + All poles are 3-piece with standard 47'-6" top & mid sections.

"Near Pole Top" allows input of any elevation to determine the diameter and moment capacity.
 The Fixity Point Below Groundline cannot exceed embedment depth.

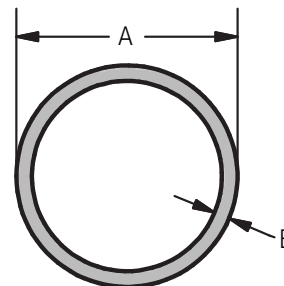
Seamless Bus Pipe

Seamless bus pipe is an extruded tubular product used to convey electricity. It is manufactured to a "nominal," not actual, inside diameter. The wall thickness is described by a "schedule." The schedules are determined by the American Standards Association.

Seamless bus pipe is generally made of 6063-T6 alloy in ANSI Schedule 40 pipe because of its excellent mechanical and electrical properties. 6061-T6 alloy tubular bus is used where high strength and lower conductivity are required.

Specification: B-241 (Seamless Pipe)

Note: For seamless bus tubing over 6 inches, see page 7.



Schedule 40

Nominal Size	Outside Diameter of Tube	Wall Thickness	Area	Weight
in	in	in	sq in	lb/ft
SCH 40	A	B		
1	1.315	0.133	0.4939	0.581
1 1/4	1.660	0.140	0.6685	0.786
1 1/2	1.900	0.145	0.7995	0.940
2	2.375	0.154	1.0750	1.264
2 1/2	2.875	0.203	1.7040	2.004
3	3.500	0.216	2.2280	2.621
3 1/2	4.000	0.226	2.6800	3.151
4	4.500	0.237	3.1740	3.733
4 1/2	5.001	0.247	3.6880	4.337
5	5.563	0.258	4.3000	5.057
6	6.625	0.280	5.5810	6.564

Schedule 80

Nominal Size	Outside Diameter of Tube	Wall Thickness	Area	Weight
in	in	in	sq in	lb/ft
SCH 80	A	B		
1	1.315	0.179	0.6388	0.751
1 1/4	1.660	0.191	0.8815	1.037
1 1/2	1.900	0.200	1.0680	1.256
2	2.375	0.218	1.4770	1.737
2 1/2	2.875	0.276	2.2540	2.650
3	3.500	0.300	3.0160	3.547
3 1/2	4.000	0.318	3.6780	4.326
4	4.500	0.337	4.4070	5.183
4 1/2	5.000	0.355	5.1800	6.092
5	5.563	0.375	6.1120	7.188
6	6.625	0.432	8.4050	9.884

Ordering Instructions:

Step 1: Choose Nominal Size

Nominal Size	Size Code
1	100
1 1/4	125
1 1/2	150
2	200
2 1/2	250
3	300
3 1/2	350
4	400
4 1/2	450
5	500
6	600

Step 2: Choose Schedule

Schedule Number	Schedule Code
SCH 40	S40
SCH 80	S80

Step 5: Choose Packaging

Package Type	Package Code
Bare - Bat - Bundle (BBB)	B
EHV	E

See pictures on page 3

Step 3: Choose Alloy

Alloy Number	Alloy Code
6061	X
6063	Y
6101	Z

Step 4: Choose Temper

Temper	Temper Code
T6	T6
T61	T61
T63	T63

Step 6: Build Catalog Number

Size Code	+	Schedule Code	+	Alloy Code	+	Temper	+	Package Code
-----------	---	---------------	---	------------	---	--------	---	--------------

Example: To order 2 1/2 inch Schedule 40 6101 T-61 Alloy Bus Pipe with BBB packaging

250	+	S40	+	Z	+	T61	+	B
-----	---	-----	---	---	---	-----	---	---

Completed Catalog Number is 250S40ZT61B.

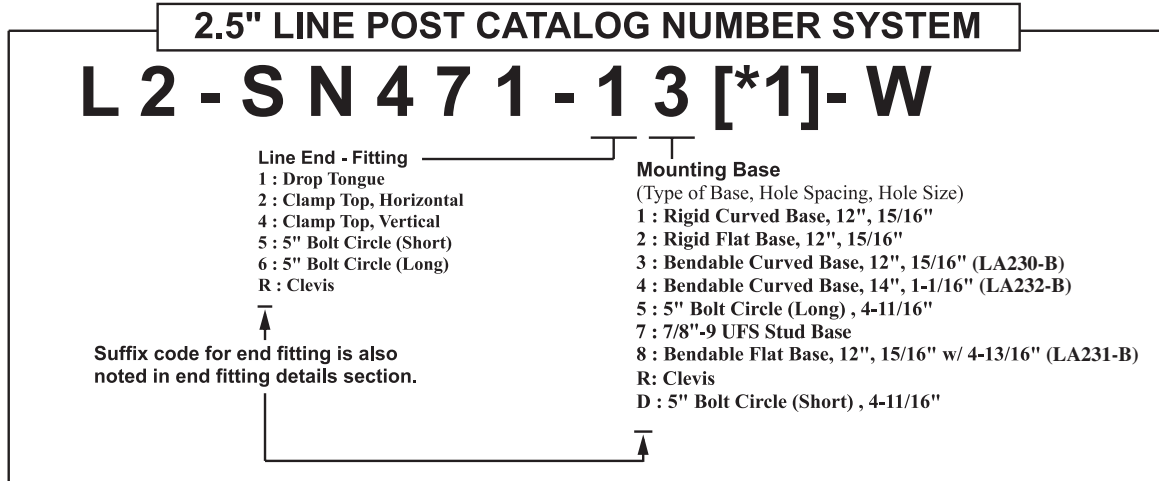
Physical & Electrical Properties of Aluminum

Standard Pipe-Size Conductors at Typical Conductivities

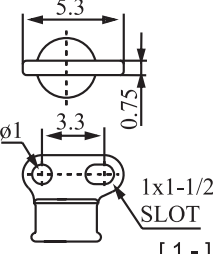
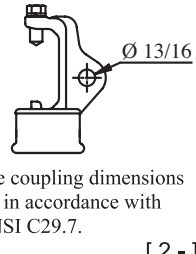
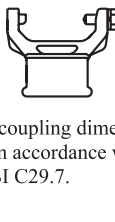
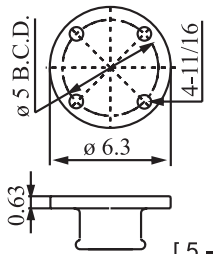
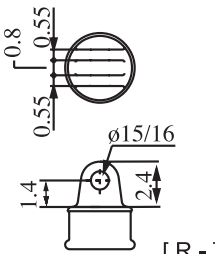
Nominal Size in	A	B	Area sq in	Weight lbs/ft	Inductive reactance 1 ft spacing 60 Hz microhm/ ft	6063-T6				6061-T6			
	Outside Diameter of Tube in	Wall Thickness in				DC Resistance at 20°C microhms/ ft	60 Hz Rac/RDC at 70°C	AC Resistance at 70°C 60 Hz microhms/ft	Current Ratings Amp at 60 Hz (1) (2) (3) (4) Outdoor	DC Resistance at 20°C microhms/ft	60 Hz Rac/RDC at 70°C	AC Resistance at 70°C 60 Hz microhms/ft	Current Ratings Amp at 60 Hz (1) (2) (3) (4) Outdoor
Schedule 40 Pipe													
1	1.315	0.133	0.494	0.581	68.24	31.120	1.00039	36.580	681	38.360	1.00032	43.820	622
1 1/4	1.660	0.140	0.669	0.786	62.68	22.990	1.00050	27.030	859	28.340	1.00039	32.370	705
1 1/2	1.900	0.145	0.800	0.940	59.45	19.220	1.00064	22.600	984	23.690	1.00046	27.070	900
2	2.375	0.154	1.075	1.264	54.15	14.300	1.00082	16.820	1234	17.630	1.00055	20.140	1128
2 1/2	2.875	0.203	1.704	2.004	49.85	9.019	1.00220	10.620	1663	11.170	1.00150	12.710	1520
3	3.500	0.216	2.228	2.621	45.19	6.897	1.00300	8.126	2040	8.500	1.00180	9.725	1865
3 1/2	4.000	0.226	2.680	3.151	42.05	5.736	1.00380	6.761	2347	7.070	1.00220	8.091	2145
4	4.500	0.237	3.174	3.733	39.28	4.842	1.00470	5.712	2664	5.968	1.00270	6.834	2436
4 1/2	5.001	0.247	3.688	4.337	36.81	4.167	1.00570	4.920	2984	5.136	1.00330	5.885	2728
5	5.563	0.258	4.300	5.057	34.31	3.574	1.00680	4.224	3348	4.406	1.00400	5.051	3063
6	6.625	0.280	5.581	6.564	30.23	2.754	1.00950	3.263	4064	3.394	1.00540	3.897	3719
Schedule 80 Pipe													
1	1.315	0.179	0.639	0.751	68.81	24.060	1.00100	28.300	774	29.650	1.00075	33.840	707
1 1/4	1.660	0.191	0.882	1.037	63.14	17.440	1.00140	20.520	985	21.490	1.00105	24.570	901
1 1/2	1.900	0.200	1.068	1.256	59.89	14.390	1.00200	16.940	1137	17.730	1.00150	20.280	1039
2	2.375	0.218	1.477	1.737	54.56	10.400	1.00280	12.260	1446	12.820	1.00210	14.670	1322
2 1/2	2.875	0.276	2.254	2.650	50.23	6.820	1.00720	8.071	1907	8.406	1.00390	9.647	1746
3	3.500	0.300	3.016	3.547	45.55	5.096	1.01030	6.050	2363	6.281	1.00490	7.225	2199
3 1/2	4.000	0.318	3.678	4.326	42.39	4.178	1.01380	4.972	2735	5.150	1.00750	5.935	2507
4	4.500	0.337	4.407	5.183	39.61	3.487	1.01710	4.168	3118	4.298	1.00950	4.965	2862
4 1/2	5.000	0.355	5.180	6.092	37.13	2.967	1.02100	3.559	3505	3.657	1.01160	4.236	3221
5	5.563	0.375	6.112	7.188	34.63	2.515	1.02600	3.032	3949	3.099	1.01650	3.604	3631
6	6.625	0.432	8.405	9.884	30.58	1.829	1.04570	2.247	4891	2.254	1.02120	2.656	4532

Notes:

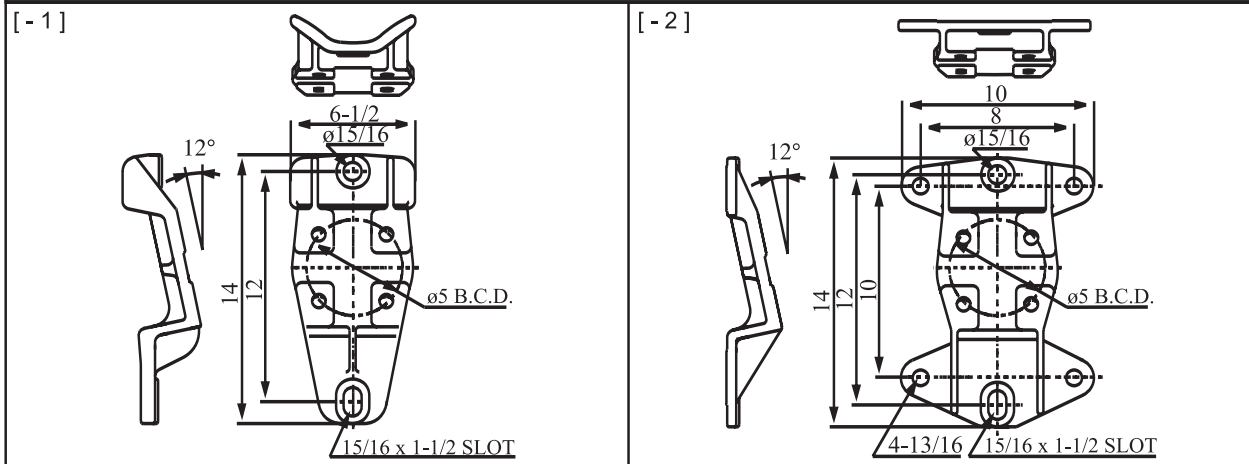
- Current ratings listed in the Tables are based on 30°C temperature rise over 40°C ambient horizontally mounted conductors, with spacing sufficient to eliminate proximity effects, generally assumed not to be significant if spacing is 18 in. or over. Conduction of heat by supporting structures and taps can appreciably affect the ratings.
- Conductors with a 2ft/sec crosswind. Nominal oxidized surface ($e=0.50$)
- Current Ratings for direct current are close to those of alternating current for all except the larger sizes; and for them, the increase for dc bus is about 1.5 percent.
- NEMA Standard SG1-3.02 (7/13/60) lists current rating for tubes of 57%-61% IACS conductivity, but without stated emissivity factors. However, even after adjustment for the 53% IACS conductivity of 6063-T6 alloy (and 43% for 6061-T6 alloy), the ratings differ somewhat from those of this table.



End Fitting & Base Variations

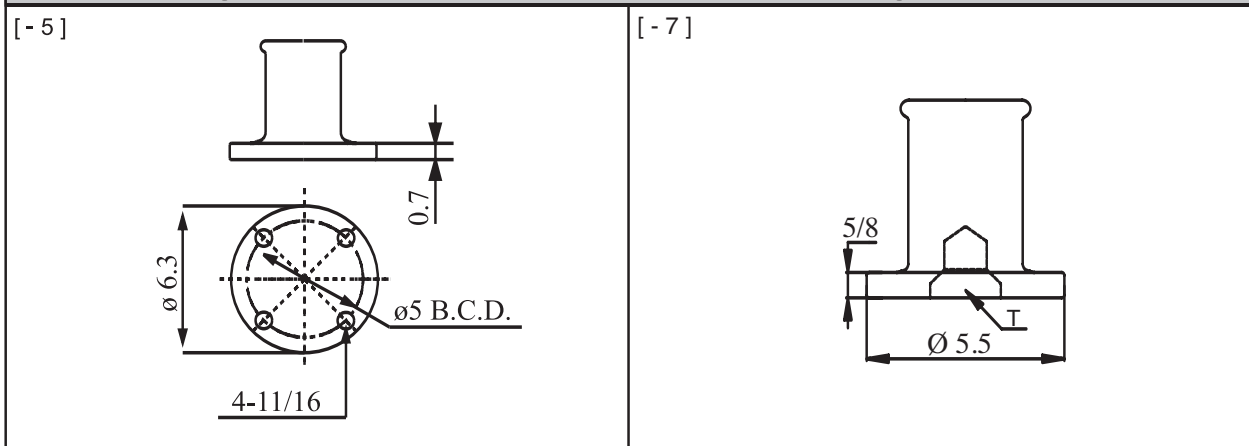
End Fitting Details for 2.5" Polymer Line Post				
 [1 -]	 [2 -]	 [4 -]	 [5 -]	 [R -]
Drop Tongue	Horizontal Clamp Top	Vertical Clamp Top	Flange	Clevis

Base Details for 2.5" Polymer Line Post



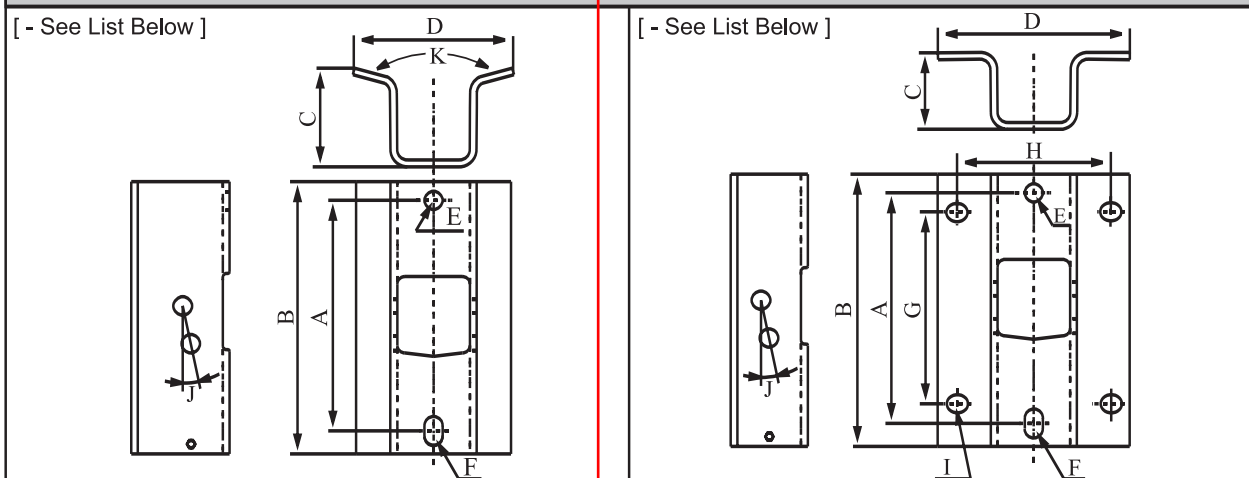
Rigid Curved Base

Rigid Flat Base



Flange Base

Stud Base



Bendable Curved Base

Bendable Flat Base

Dimensions	A	B	C	D	E (ø)	F (Slot)	G	H	I	J	K
Bendable Curved Base (LA230-B) [- 3]	12	14.2	5	8.3	1	1 x 1-1/2	-	-	-	12°	150°
Bendable Flat Base (LA231-B) [- 8]	12	14.2	4	10	1	1 x 1-1/2	10	8	13/16 x 1	12°	-
Bendable Curved Base (LA232-B) [- 4]	14	17	5	8.3	1-1/16	1-1/16 x 1-1/2	-	-	-	12°	150°

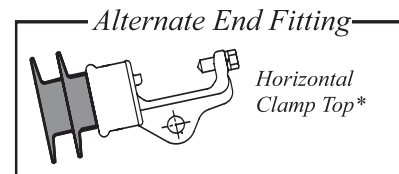
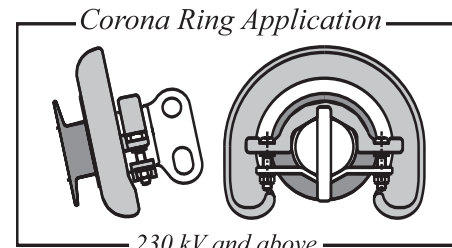
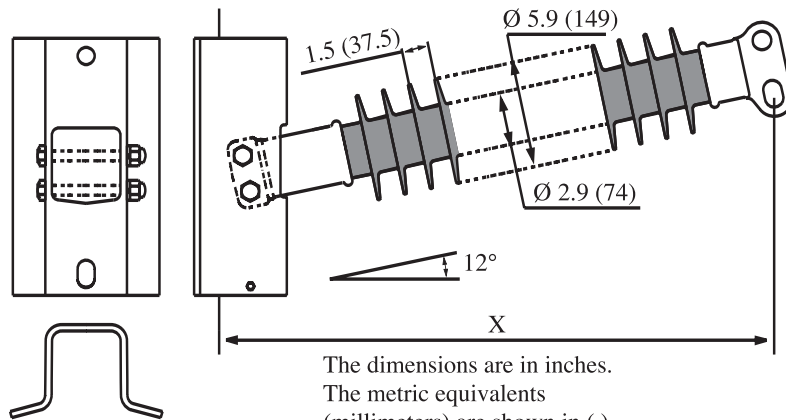
* Contact the manufacturer for other base variations

[Unit: Inches]



2.5" (63 mm) Core

Standard Leakage Shed (SN) Series



Tensile Mechanical Rating

	SML	Min. RTL
Tongue :	15,000 lbs	7,500 lbs.
Clamp Top :	5,000 lbs	2,500 lbs.

Typical System Voltage kV	Catalog No.	No. of Sheds	"X" Length in. (mm)	Arcing Distance in. (mm)	Leakage Distance in. (mm)	Low Frequency Flshover		Critical Impulse Flashover		Maximum Design Cantilever Load lbs. (kN)	Approx. Weight lbs. (kg)
						Dry kV	Wet kV	Pos. kV	Neg. kV		
69	L2-SN141-13	14	32.1 (816)	22.3 (567.5)	57.9 (1470)	265	230	370	425	2860 (12.7)	51.3 (23.3)
69/115	L2-SN181-13	18	37.9 (963)	28.2 (717.5)	74.4 (1890)	325	285	460	515	2395 (10.6)	54.9 (24.9)
69/115	L2-SN211-13	21	42.2 (1073)	32.7 (830.0)	86.8 (2205)	370	325	525	585	2160 (9.6)	57.6 (26.1)
115	L2-SN251-13	25	48.0 (1220)	38.6 (980.0)	103.3 (2625)	425	370	615	675	1910 (8.5)	61.2 (27.8)
115/138	L2-SN291-13	29	53.8 (1366)	44.5 (1130.0)	119.9 (3045)	475	420	700	770	1670 (7.4)	64.8 (29.4)
115/138	L2-SN321-13	32	58.1 (1476)	48.9 (1242.5)	132.3 (3360)	515	450	765	840	1530 (6.8)	67.5 (30.7)
138	L2-SN361-13	36	63.9 (1623)	54.8 (1392.5)	148.8 (3780)	565	495	855	930	1375 (6.1)	71.2 (32.3)
161	L2-SN391-13	39	68.2 (1733)	59.3 (1505.0)	161.2 (4095)	600	525	920	1000	1275 (5.7)	73.9 (33.5)
161	L2-SN431-13	43	74.0 (1880)	65.2 (1655.0)	177.8 (4515)	645	565	1010	1090	1165 (5.2)	77.5 (35.2)
230	L2-SN471-13	47	79.8 (2027)	71.1 (1805.0)	194.3 (4935)	690	605	1095	1180	1075 (4.8)	81.1 (36.8)
230	L2-SN511-13	51	85.6 (2173)	77.0 (1995.0)	210.8 (5335)	730	640	1185	1275	995 (4.4)	84.7 (38.5)
230	L2-SN551-13	55	91.3 (2320)	82.9 (2105.0)	227.4 (5775)	770	675	1270	1365	925 (4.1)	88.3 (40.1)
230	L2-SN581-13	58	95.7 (2430)	87.3 (2217.5)	239.8 (6090)	800	700	1340	1435	880 (3.9)	91.1 (41.3)

* The clamp top dimensions comply with ANSI C29.7-1992.

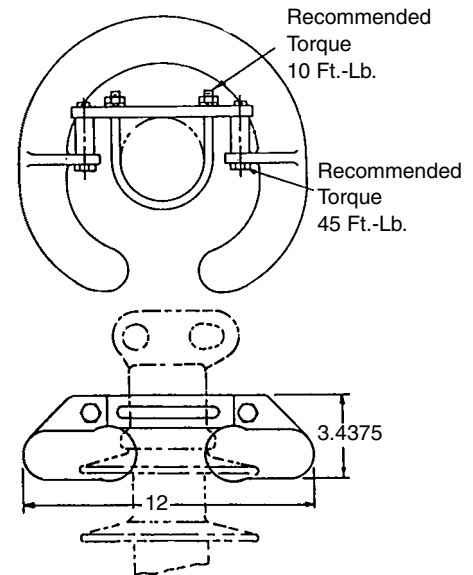


2.5" (63.5mm) Rod Diameter Horizontal Line Posts

Corona Rings

Hi*Lite XL line post insulators are corona free through 161 kV.

Application	161 kV & below	230 kV	345 kV
Line End Energized	Top - NONE Bott - NONE	Top - 2721273001 Bott - NONE	Top - 2721273001 Bott - NONE
Bottom End Energized	Top - NONE Bott - NONE	Top - NONE Bott - 2721273001	Top - NONE Bott - 2721273001



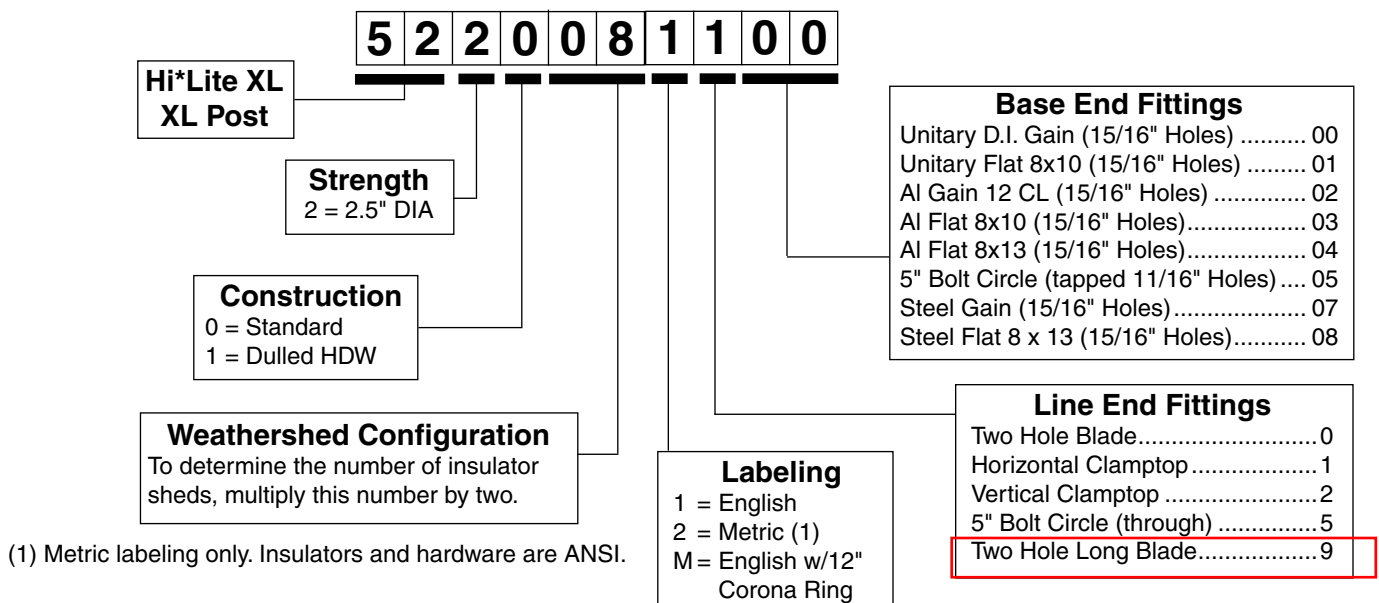
**Part Number 2721273001
Control Ring**

B

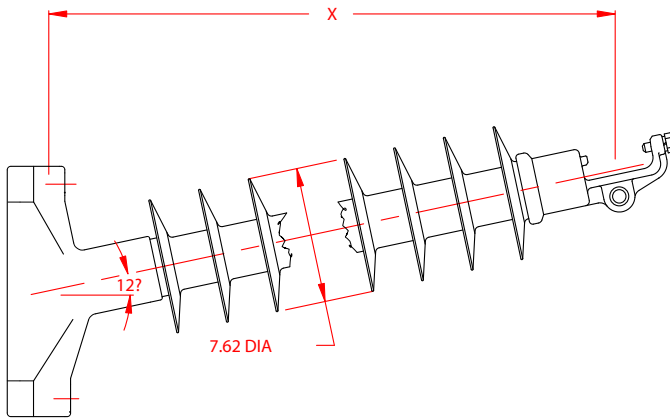
Packaging

Hi*Lite XL line post insulators are packaged in appropriate quantities in open wood crates. As an option, Ohio Brass offers packaging of the insulators in individual sleeves.

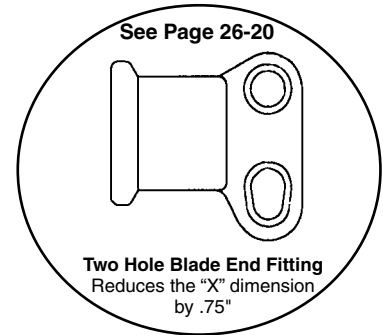
Hi*Lite XL Line Post Insulators: Key to the Catalog Numbers



2.5" (63.5mm) Rod Diameter Horizontal Line Posts



Line & Base Detail see pages 26-19 & 26-20



Clamptop:

Maximum Design Tension = 2,500 lb (11.1 kN)

Two-Hole Blade:

Maximum Design Tension = 7,500 lb. (33.4 kN)

Selection Guide Typical Line Voltage, kV						Catalog # with Gain Base & Clamptop	"X" Length Inches	No. of Sheds	Dry Arc Distance inches	Leakage Distance inches	⁽¹⁾ 60 Flashover ANSI		⁽¹⁾ Critical Flashover ANSI		RCL pounds	Net Weight pounds
69	115	138	161	230	345	End Fittings	(mm)		(mm)	(mm)	Dry-kV	Wet-kV	Pos-kV	Neg-kV	(kN)	(kg)
						5220041100	33.5 (851)	8	23 (584)	54 (1372)	215	195	340	455	2500 (11.1)	47 (21.3)
						5220051100	38.6 (980)	10	28 (711)	68 (1727)	270	245	420	535	2500 (11.1)	50 (22.7)
						5220061100	43.9 (1115)	12	33 (838)	82 (2083)	325	295	505	620	2135 (9.5)	54 (24.5)
						5220071100	49.2 (1250)	14	39 (991)	96 (2438)	385	340	590	705	1865 (8.3)	57 (25.9)
						5220081100	54.5 (1384)	16	44 (1118)	110 (2794)	440	385	675	785	1650 (7.3)	61 (27.7)
						5220091100	59.6 (1514)	18	49 (1245)	124 (3150)	490	430	760	865	1490 (6.6)	65 (29.5)
						5220101100	64.8 (1646)	20	55 (1397)	138 (3505)	545	475	845	950	1350 (6.0)	68 (30.9)
						5220111100	70.1 (1781)	22	60 (1524)	152 (3861)	600	520	930	1035	1235 (5.5)	72 (32.7)
						5220121100	75.4 (1915)	24	65 (1651)	166 (4216)	650	560	1015	1115	1140 (5.0)	75 (34.1)
						5220131100	80.5 (2045)	26	71 (1803)	180 (4572)	700	600	1095	1195	1060 (4.7)	79 (35.9)
						5220141100	85.8 (2180)	28	76 (1930)	194 (4928)	755	635	1180	1280	990 (4.4)	82 (37.2)
						5220151100	91.1 (2314)	30	81 (2057)	208 (5283)	805	675	1265	1365	925 (4.1)	86 (39.0)
						5220161100	96.3 (2446)	32	87 (2210)	222 (5639)	855	710	1350	1445	870 (3.6)	89 (40.4)
						5220171100	101.4 (2575)	34	92 (2337)	236 (5994)	905	745	1435	1525	820 (3.6)	93 (42.2)
						5220181100	106.7 (2710)	36	97 (2464)	250 (6350)	955	780	1520	1610	780 (3.5)	97 (44.0)
						5220191100	112.0 (2845)	38	103 (2616)	264 (6706)	1005	810	1605	1695	740 (3.3)	100 (45.4)

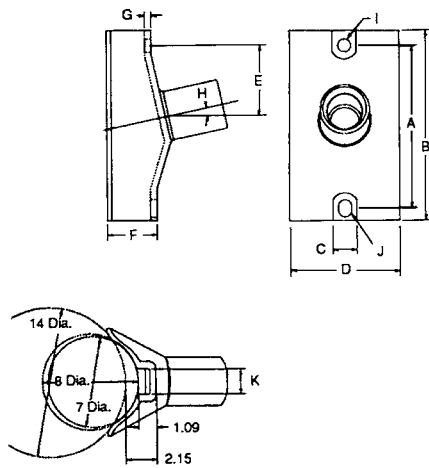
Notes: (1) Tests in accordance with ANSI C29.1-1982. Electrical values are without corona ring.

(2) RCL is the maximum continuous load at which the post should be applied.

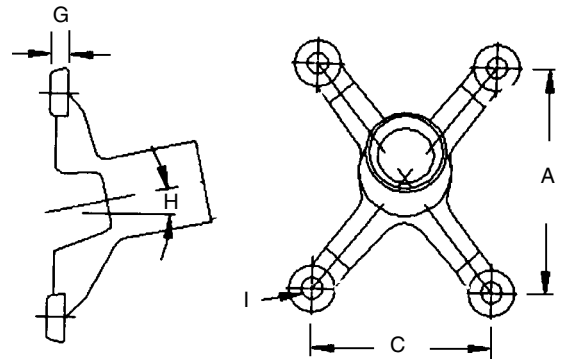
For voltages above 161 kV refer to Page 26-15 for Corona Rings.

Dimensions are within allowable tolerances as specified in ANSI C29.11.

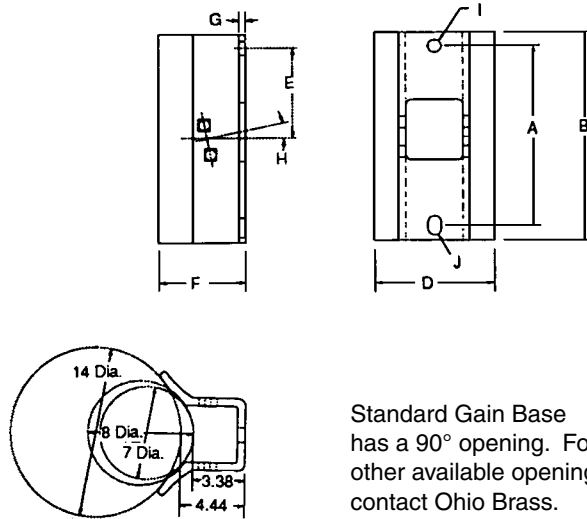
2.5" (63.5 mm) Rod Diameter Base Fittings



Unitary Gain

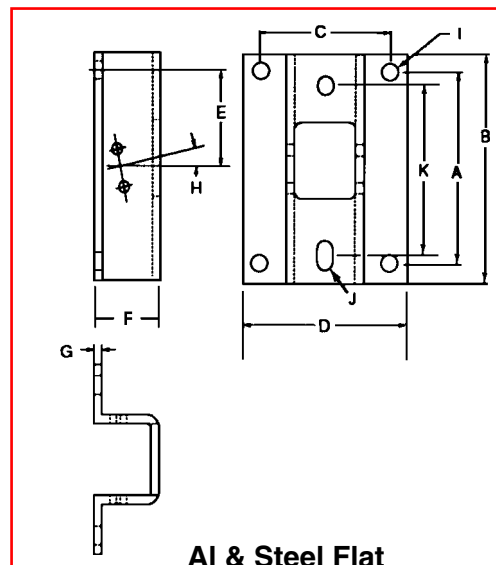


Unitary Flat



Al & Steel Gain

Standard Gain Base has a 90° opening. For other available openings, contact Ohio Brass.



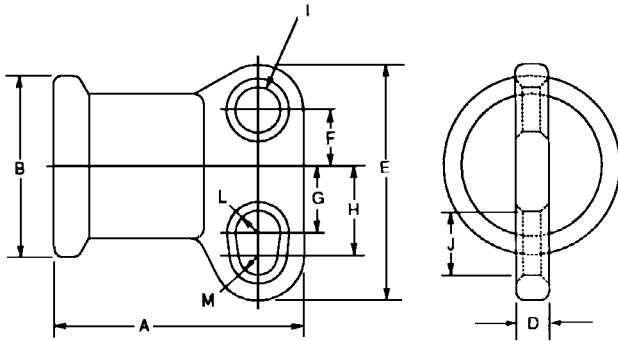
Al & Steel Flat

Horizontal & Vertical Bases Dimensions (in inches)

Type (Code)*	A	B	C	D	E	F	G	H	I	J	K	Material
Unitary D.I. Gain (00)	12.0	14.0	1.75	8.06	-	3.54	0.5	12°	0.94	0.94 x 1.31	1.90	60-45-12 D.I.
Unitary D.I. Flat (01)	10.0	12.2	8.0	10.0	5.0	-	0.8	12°	0.94	-	-	60-45-12 D.I.
5" B.C. (15)	4.75	6.25	3.63	0.90	5.0	-	-	-	0.69	-	-	60-45-12 D.I.
5" B.C. (05)	4.75	6.25	3.63	0.90	5.0	-	-	-	5/8 - 11 UFS	-	-	60-45-12 D.I.
Al Gain (02)	12.0	14.0	-	8.06	6.13	5.56	0.5	12°	0.94	0.94 x 1.31	-	6063 T5 Al
Al Gain (12)	12.0	14.0	-	8.06	6.13	5.56	0.5	12°	0.81	0.94 x 1.31	-	6063 T5 Al
Steel Gain (07)	12.0	15.0	-	8.33	6.5	6.04	0.38	12°	0.94	0.94 x 2.0	-	Low Carbon Steel
Al Flat (03)	10.0	12.0	8.0	10.0	5.0	4.0	0.5	12°	0.94	-	-	6063 T5 Al
Al Flat (13)	10.0	12.0	8.0	10.0	5.0	4.0	0.5	12°	0.81	-	-	6063 T5 Al
Steel Flat (08)	13.0	15.0	8.0	10.0	6.5	4.0	0.5	12°	1.125 x 0.94	0.94 x 2	12.0	Low Carbon Steel
Al Flat (04)	13.0	15.0	8.0	10.0	6.5	4.0	0.5	12°	0.94	0.94 x 1.31	12.0	6063 T5 Al
Al Flat (14)	13.0	15.0	8.0	10.0	6.5	4.0	0.5	12°	0.81	0.81 x 1.31	12.0	6063 T5 Al

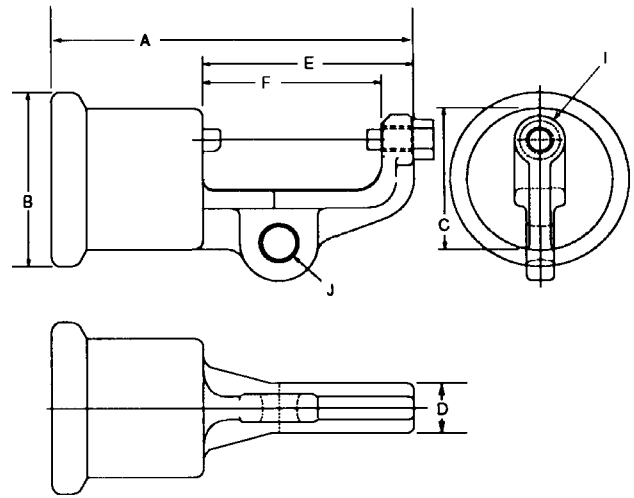
*Code is the third and fourth numbers in the Suffix Code of the Catalog Number.

2.5" (63.5 mm) Rod Diameter Line Fittings

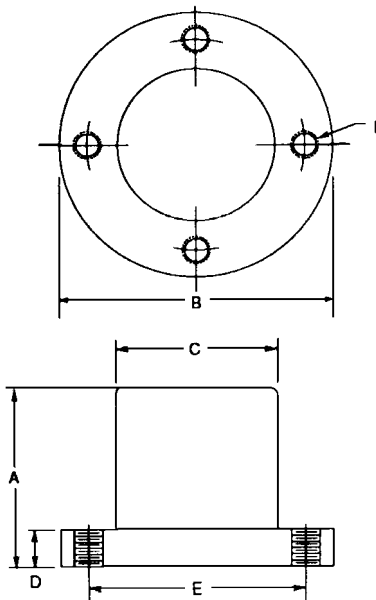


Transverse Compressing Swing Angle for Conductor Suspension Clamp	
2 Hole Blade (Std.)	2 Hole Long Blade
40 deg. max.	64 deg. max.

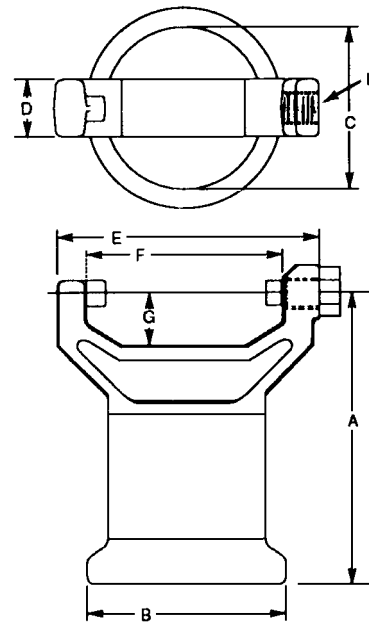
Two Hole Blade
*12° upsweep post angles



Horizontal Clamptop



5" Bolt Circle
Line or Base Fitting



Vertical Clamptop
Part per ANSI C29.7

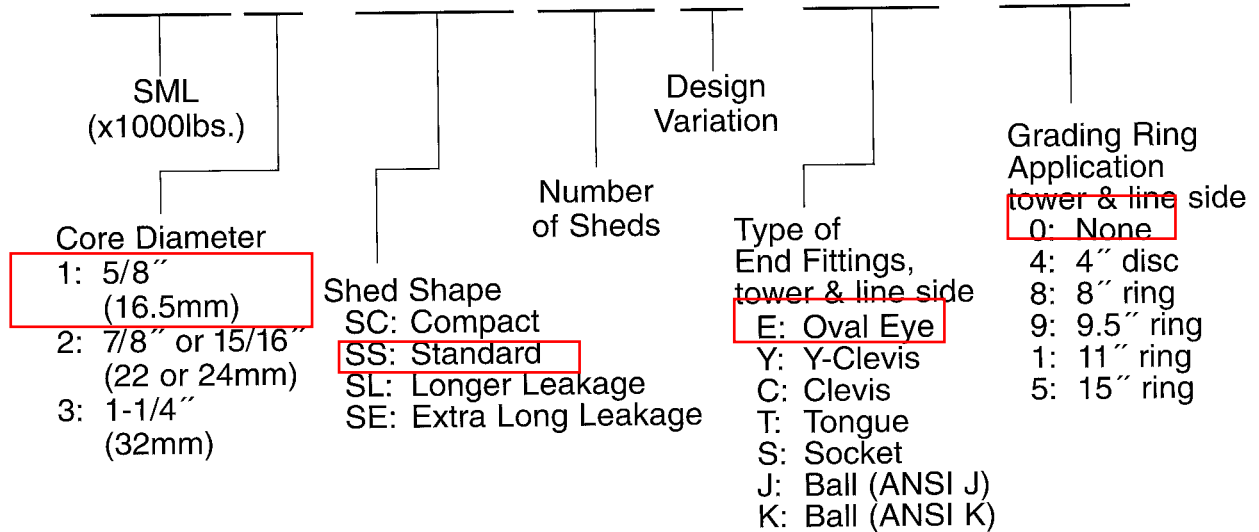
Horizontal & Vertical End Fittings Dimensions (in inches)

Type (Code)*	A	B	C	D	E	F	G	H	I	J	L	M	Material
2 Hole Blade (0)	5.73	4.0	-	0.75	5.25	1.25	1.50	2.00	1.0	1.44	0.5R	0.44 R	60-40-18 D.I.
2 Hole Long Blade (9)	5.73	4.0	-	0.75	7.75	1.25	4.0	4.5	1.0	1.44	0.5R	0.44R	60-40-18 D.I.
H. Clamptop (1)	8.24	4.0	3.30	1.12	4.72	4.0	-	-	5/8 - 11 UFS	0.75	-	-	60-40-18 D.I.
5" B.C. (3)	4.75	6.25	3.63	0.90	5.0	-	-	-	5/8 - 11 UFS	-	-	-	60-45-12 D.I.
5" B.C. (5)	4.75	6.25	3.63	0.90	5.0	-	-	-	0.69 x Holes	-	-	-	60-45-12 D.I.
V. Clamptop (2)	5.88	4.0	3.30	1.12	5.37	4.0	1.06	-	5/8 - 11 UFS	-	-	-	60-40-18 D.I.

*Code is the 2nd number in the Suffix Code of the Catalog Number.

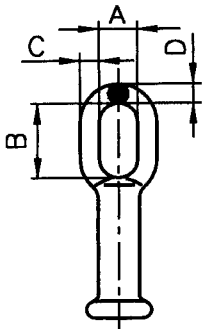
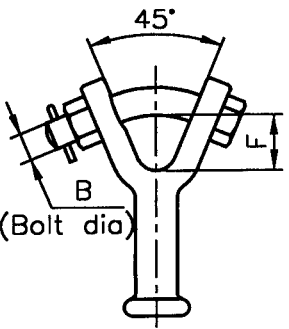
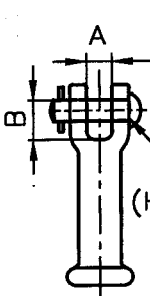
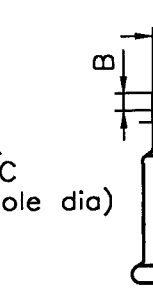
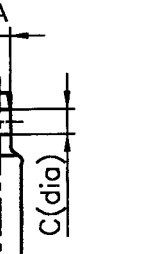
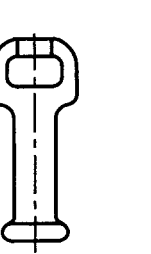
CATALOG NUMBER SYSTEM

251-SS310-SJ-08



CONFIGURATION OF END FITTINGS

Dimension Unit: inch (mm)

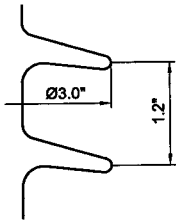
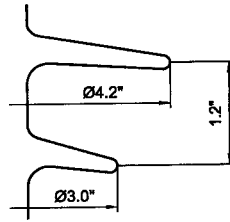
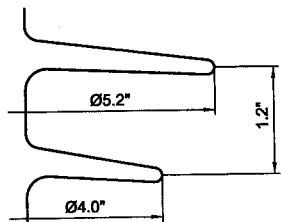
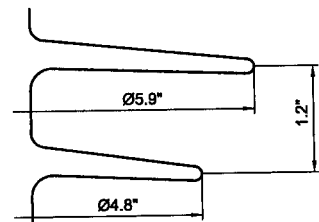
Diagram	OVAL EYE (E)	Y-CLEVIS (Y)	CLEVIS (C)	TONGUE (T)	SOCKET (S)	BALL (J,K)								
														
SML LBS(kN)	Oval Eye				Y-Clevis		Clevis			Tongue			Socket/Ball	
	A	B	C	D	F min	B	A	B min	C	A	B	C	Type	ANSI Class
25,000 (111)	1.02 (26)	2.0 (51)	0.63 (16)	0.63 (16)	1.54 (39)	0.75 (19)	0.75 (19)	0.98 (25)	0.69 (17.5)	0.53 (13.5)	0.52 (13.3)	0.69 (17.5)	J	52-5
30,000 (133)	1.02 (26)	2.0 (51)	0.87 (22)	0.87 (22)	1.57 (40)	0.875 (22)	0.75 (19)	0.98 (25)	0.69 (17.5)	0.53 (13.5)	0.52 (13.3)	0.69 (17.5)	J	52-5
50,000 (222)	1.02 (26)	2.0 (51)	0.87 (22)	0.87 (22)	1.57 (40)	0.875 (22)	1.06 (27)	1.26 (32)	0.94 (24)	0.90 (22.8)	0.59 (14.9)	0.94 (24)	K	52-11
80,000 (356)	1.14 (29)	2.9 (74)	0.98 (25)	1.38 (35)	—	—	—	—	—	—	—	—	—	—

HOW TO SELECT CATALOG NUMBER

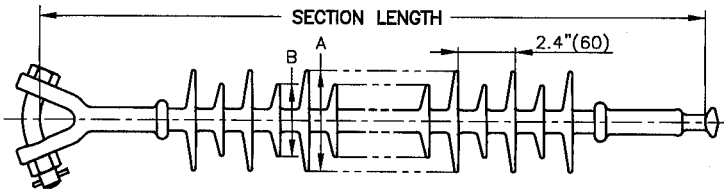
Our catalog number is self-explanatory. Please follow the following general guidance to determine a catalog number.

No.	Procedures	Example (equivalent to ANSI 52-5, 7 bells)	
1	To select mechanical rating, SML	If rating is 25kip, 251 (refer to page 5)	251-S__0-__-__
2	To select Shed Profile on the basis of leakage distance. See the following "Shed profile" for details.	If medium contamination area, shed profile is SS (refer to shed profile in this page)	251-SS__0-__-__
3	To select Number of Sheds on the basis of section length	If section length is 40 ¹ / ₄ " (=5 ³ / ₄ " x7), number of sheds is 25 (refer to page 7~16)	251-SS250-__-__
4	To select configuration of End Fitting	If socket & ball, -SJ (refer to page 5)	251-SS250-SJ-__
5	To select Grading Ring application on the basis of system voltage	If system voltage is 230kV, ring application is -08 (refer to page 4)	251-SS250-SJ-08

SHED PROFILE

"SC" SHED COMPACT TYPE FOR LIGHT CONTAMINATION AREA 	"SS" SHED STANDARD TYPE FOR MEDIUM CONTAMINATION AREA 
"SL" SHED LONGER LEAKAGE TYPE FOR HEAVY CONTAMINATION AREA 	"SE" SHED EXTRA LONG LEAKAGE TYPE FOR VERY HEAVY CONTAMINATION AREA 

ANSI 25kip / SC, SS, SL Shed Series



Shed Type	Shed Diameter	
	A	B
"SC" Normal	ø3.0" (ø76mm)	ø3.0" (ø76mm)
"SS" Alternating	ø4.2" (ø106mm)	ø3.0" (ø76mm)
"SL" Alternating	ø5.2" (ø132mm)	ø4.0" (ø102mm)

Typical System Voltage (kV)	Catalog No.	No. of Sheds	Section Length			Leakage Distance inch (mm)	Arcing Distance inch (mm)	Low Frequency Flashover		Critical Impulse Flashover		Approx. Weight lbs. (kg)
			YJ inch (mm)	SJ inch (mm)	EJ inch (mm)			Dry kV	Wet kV	Positive kV	Negative kV	
69	251-SC210-YJ	21	36.0 (915)	35.4 (900)	36.4 (925)	58.7 (1491)	26.5 (674)	305	270	450	480	7.1 (3.2)
	251-SS210-YJ					71.5 (1816)	27.1 (688)	310	275	460	490	8.1 (3.7)
	251-SL210-YJ					92.8 (2356)	27.9 (708)	320	280	470	505	10.1 (4.6)
69	251-SC250-YJ	25	40.7 (1035)	40.2 (1020)	41.1 (1045)	69.9 (1775)	31.2 (794)	350	310	525	560	7.6 (3.5)
	251-SS250-YJ					85.0 (2159)	31.8 (808)	355	310	535	565	8.9 (4.0)
	251-SL250-YJ					110.3 (2802)	32.6 (828)	360	320	545	580	11.3 (5.1)
69/115	251-SC280-YJ	28	44.3 (1125)	43.7 (1110)	44.7 (1135)	78.3 (1988)	34.8 (884)	380	340	580	615	8.1 (3.7)
	251-SS280-YJ					94.5 (2401)	35.1 (892)	385	340	585	620	9.4 (4.3)
	251-SL280-YJ					122.9 (3122)	35.8 (909)	390	345	595	630	12.1 (5.5)
69/115	251-SC310-YJ	31	47.8 (1215)	47.2 (1200)	48.1 (1225)	86.7 (2201)	38.3 (974)	415	365	635	675	8.5 (3.9)
	251-SS310-YJ					105.2 (2673)	38.9 (988)	420	370	645	680	10.1 (4.6)
	251-SL310-YJ					136.7 (3471)	39.7 (1008)	430	380	655	695	13.0 (5.9)
115/138	251-SC350-YJ	35	52.6 (1335)	52.0 (1320)	53.0 (1345)	97.8 (2485)	43.1 (1094)	460	405	705	750	9.1 (4.1)
	251-SS350-YJ					118.7 (3016)	43.6 (1108)	465	410	715	760	10.8 (4.9)
	251-SL350-YJ					154.2 (3917)	44.4 (1128)	470	420	730	770	14.2 (6.4)
138	251-SC390-YJ	39	57.3 (1455)	56.7 (1440)	57.7 (1465)	109.0 (2769)	47.8 (1214)	505	445	780	825	9.6 (4.4)
	251-SS390-YJ					132.2 (3359)	48.4 (1228)	510	450	790	835	11.6 (5.3)
	251-SL390-YJ					171.8 (4363)	49.1 (1248)	515	460	800	850	15.3 (6.9)
138	251-SC410-YJ	41	59.6 (1515)	59.1 (1500)	60.0 (1525)	114.6 (2911)	50.2 (1274)	525	465	815	865	9.9 (4.5)
	251-SS410-YJ					139.0 (3531)	50.7 (1288)	530	470	825	875	11.9 (5.4)
	251-SL410-YJ					180.6 (4586)	51.5 (1308)	540	480	840	885	15.9 (7.2)
138/161	251-SC450-YJ	45	64.4 (1635)	63.8 (1620)	64.8 (1645)	125.8 (3195)	54.9 (1394)	570	505	890	940	10.5 (4.8)
	251-SS450-YJ					152.5 (3874)	55.4 (1408)	575	510	900	950	12.7 (5.8)
	251-SL450-YJ					198.1 (5032)	56.2 (1428)	580	520	910	965	17.0 (7.7)
161	251-SC500-YJ	50	70.3 (1785)	69.7 (1770)	70.7 (1795)	139.8 (3550)	60.8 (1544)	625	555	980	1040	11.2 (5.1)
	251-SS500-YJ					168.8 (4288)	61.1 (1552)	625	560	985	1045	13.6 (6.2)
	251-SL500-YJ					219.5 (5575)	61.8 (1569)	635	565	995	1055	18.4 (8.3)
161	251-SC550-YJ	55	76.2 (1935)	75.6 (1920)	76.8 (1950)	153.7 (3905)	66.7 (1695)	680	605	1075	1135	11.9 (5.4)
	251-SS550-YJ					186.3 (4731)	67.3 (1709)	685	610	1080	1145	14.6 (6.6)
	251-SL550-YJ					242.0 (6147)	68.1 (1729)	690	615	1095	1155	19.9 (9.0)

Existing 251-SS550-EE (SS560 shown on dwg)
Length = 76.8 + 1.4 = 78.2



25kip Other End Fitting Combination Section Length Adjustment Table, Base Coupling: Eye-Ball (EJ), Inch

Eye/Eye (EE)	+1.4	Clevis/Eye (CE)	+0.4	Clevis/Clevis (CC)	-0.6
Clevis/Ball (CJ)	-1.0	Y-Clevis/Y-Clevis (YY)	+0.5	Y-Clevis/Tongue (YT)	+0.5
Y-Clevis/Eye (YE)	+0.9	Y-Clevis/Socket (YS)	-0.1	Clevis/Tongue (CT)	0

Typical System Voltage (kV)	Catalog No.	No. of Sheds	Section Length			Leakage Distance inch (mm)	Arcing Distance inch (mm)	Low Frequency Flashover		Critical Impulse Flashover		Approx. Weight lbs. (kg)
			YJ inch (mm)	SJ inch (mm)	EJ inch (mm)			Dry kV	Wet kV	Positive kV	Negative kV	
161/230	251-SC590-YJ	59	80.9 (2055)	80.3 (2040)	81.5 (2070)	164.9 (4189)	71.4 (1815)	725	645	1145	1210	12.5 (5.7)
	251-SS590-YJ					199.8 (5074)	72.0 (1829)	730	650	1155	1220	15.4 (7.0)
	251-SL590-YJ					259.6 (6593)	72.8 (1849)	735	655	1170	1235	21.0 (9.5)
230	251-SC640-YJ	64	86.8 (2205)	86.2 (2190)	87.4 (2220)	178.9 (4544)	77.4 (1965)	780	695	1240	1310	13.2 (6.0)
	251-SS640-YJ					216.1 (5488)	77.7 (1973)	780	700	1245	1315	16.3 (7.4)
	251-SL640-YJ					280.9 (7136)	78.3 (1990)	785	705	1255	1325	22.4 (10.2)
230	251-SC690-YJ	69	92.7 (2355)	92.1 (2340)	93.3 (2370)	192.9 (4899)	83.3 (2115)	835	745	1330	1405	13.9 (6.3)
	251-SS690-YJ					233.5 (5932)	83.8 (2129)	840	750	1340	1415	17.3 (7.9)
	251-SL690-YJ					303.5 (7708)	84.6 (2149)	845	755	1350	1425	23.9 (10.8)
230/345	251-SC740-YJ	74	98.6 (2505)	98.0 (2490)	99.2 (2520)	206.9 (5254)	89.2 (2265)	890	795	1420	1500	14.6 (6.6)
	251-SS740-YJ					249.8 (6346)	89.5 (2273)	890	795	1425	1505	18.2 (8.3)
	251-SL740-YJ					324.8 (8251)	90.2 (2290)	895	805	1435	1515	25.3 (11.5)
230/345	251-SC780-YJ	78	103.3 (2625)	102.8 (2610)	103.9 (2640)	218.0 (5538)	93.9 (2385)	930	835	1495	1575	15.2 (6.9)
	251-SS780-YJ					263.3 (6689)	94.2 (2393)	935	835	1500	1580	19.0 (8.6)
	251-SL780-YJ					342.4 (8697)	94.9 (2410)	940	845	1510	1595	26.4 (12.0)
345	251-SC810-YJ	81	106.9 (2715)	106.3 (2700)	107.5 (2730)	226.4 (5751)	97.5 (2475)	965	865	1550	1635	15.6 (7.1)
	251-SS810-YJ					274.0 (6961)	98.0 (2489)	970	870	1560	1645	19.6 (8.9)
	251-SL810-YJ					356.1 (9046)	98.8 (2509)	975	875	1570	1655	27.3 (12.4)
345	251-SC860-YJ	86	112.8 (2865)	112.2 (2850)	113.4 (2880)	240.4 (6106)	103.4 (2626)	1010	905	1640	1730	16.4 (7.4)
	251-SS860-YJ					290.3 (7375)	103.7 (2634)	1010	905	1645	1735	20.5 (9.3)
	251-SL860-YJ					377.5 (9589)	104.4 (2651)	1015	910	1655	1745	28.7 (13.0)
345	251-SC910-YJ	91	118.7 (3015)	118.3 (3005)	119.3 (3030)	254.4 (6461)	109.3 (2776)	1050	940	1735	1825	17.1 (7.7)
	251-SS910-YJ					307.8 (7818)	109.8 (2790)	1050	940	1740	1835	21.5 (9.8)
	251-SL910-YJ					400.0 (10161)	110.6 (2810)	1055	945	1755	1850	30.2 (13.7)
345	251-SC1000-YJ	100	129.3 (3285)	128.9 (3275)	129.9 (3300)	279.5 (7100)	119.9 (3046)	1115	1000	1900	2000	18.4 (8.3)
	251-SS1000-YJ					337.6 (8575)	120.2 (3054)	1115	1000	1905	2005	23.2 (10.5)
	251-SL1000-YJ					439.0 (11150)	120.9 (3071)	1120	1005	1915	2015	32.7 (14.8)
345/500	251-SC1090-YJ	109	140.0 (3555)	139.6 (3545)	140.6 (3570)	304.7 (7739)	130.6 (3316)	1180	1055	2065	2170	19.6 (8.9)
	251-SS1090-YJ					368.6 (9362)	131.1 (3330)	1185	1060	2070	2180	24.9 (11.3)
	251-SL1090-YJ					479.1 (12168)	131.9 (3350)	1185	1065	2085	2195	35.3 (16.0)

Approx. Weight is for Y-clevis & Ball unless otherwise specified.

Test methods and criteria are in accordance with ANSI C29.11 and ANSI C29.12.

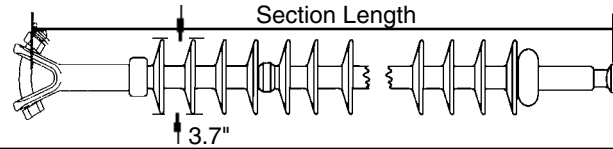
All tables show the typical products. Please contact NLPI for other dimensions and end fitting combinations.

Electrical values exceeding the capacity (AC FOV>1200kV, L.I. FOV>3000kV) are presumed by the extrapolation of values obtained from short string unit.



5/8" (16mm) Rod Diameter Suspension Insulators

Mechanical Ratings
SML = 25,000 lbs. 111 kN
RTL = 12,500 lbs. 56 kN



Proposed Change

511008-1000

Length=59.1+1.3=60.4

Existing Insulator

511011-1000

Length 77.4+1.3=78.7

Selection Guide Typical Line Voltage, kV ⁽¹⁾						Catalog Number with Y-Clevis - 52.5 Ball	Section Length Inches (mm)	Number of Sheds	Dry Arc Distance inches (mm)	Leakage Distance inches (mm)	⁽²⁾ 60 Flashover ANSI		⁽²⁾ Critical Flashover ANSI		Net Weight pounds (kg)
69	115	138	161	230	345						Dry-kV	Wet-kV	Pos-kV	Neg-kV	
						5110041201	34.7 (881)	16	24.7 (627)	61 (1549)	245	240	410	390	4.8 (2.2)
						5110051201	40.7 (1034)	20	30.7 (780)	76 (1930)	310	295	505	490	5.6 (2.5)
						5110061201	46.8 (1189)	24	36.8 (935)	92 (2337)	370	350	605	595	6.4 (2.9)
						5110071201	53.0 (1346)	28	42.9 (1090)	107 (2718)	430	405	700	695	7.1 (3.2)
						5110081201	59.1 (1501)	32	49.1 (1247)	122 (3099)	490	455	795	795	8.0 (3.6)
						5110091201	65.1 (1654)	36	55.1 (1397)	138 (3505)	545	505	890	890	8.8 (4.0)
						5110101201	71.3 (1811)	40	61.2 (1554)	152 (3861)	600	555	985	990	9.5 (4.3)
						5110111201	77.4 (1966)	44	67.4 (1712)	168 (4267)	655	605	1080	1090	10.4 (4.7)
						5110121201	83.5 (2121)	48	73.5 (1867)	184 (4674)	710	655	1170	1185	11.2 (5.1)
						5110131201	89.5 (2273)	52	79.5 (2019)	198 (5029)	760	700	1260	1280	11.9 (5.4)
						5110141201	95.7 (2431)	56	85.6 (2174)	214 (5436)	810	750	1350	1370	12.7 (5.8)
						5110151201	101.8 (2586)	60	91.7 (2329)	229 (5817)	855	790	1440	1465	13.5 (6.1)
						5110161201	108.0 (2743)	64	97.9 (2487)	245 (6223)	905	835	1530	1560	14.4 (6.5)
						5110171201	114.0 (2896)	68	103.9 (2639)	260 (6604)	945	880	1615	1650	15.2 (6.9)
						5110181201	120.1 (3051)	72	110.0 (2794)	275 (6985)	990	920	1705	1740	15.9 (7.2)
						5110191201	126.2 (3205)	76	116.2 (2951)	290 (7366)	1030	960	1790	1830	16.7 (7.6)

Notes: (1) For voltages above 345 kV, and other section lengths, contact Ohio Brass.

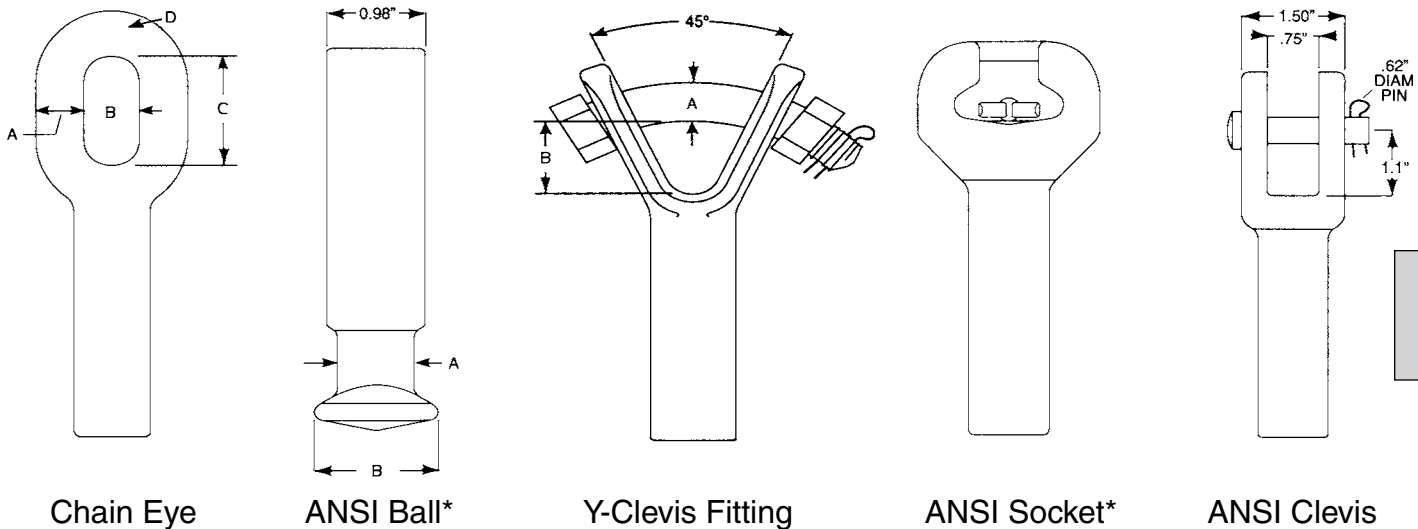
(2) Tests in accordance with ANSI C29.1-1982. Electrical values are without corona ring.

For voltages above 161 kV refer to Page 26-7 for Corona Rings, and associated physical/electrical changes to above data.
 Dimensions are within allowable tolerances as specified in ANSI C29.11.

Ground Fitting	Line Fitting	Suffix Code	Length Change		Weight Change	
			Inches	mm	Pounds	kg
Eye	Ball	1001	-.06	-1.5	-2.5	-.11
Eye	Eye	1000	1.28	32.5	-2.5	-.11
Socket	Ball	1301	-.97	-24.6	-.05	-.01
Clevis	Ball	1401	-1.00	-25.4	-.15	-.07
Y-Clevis	Eye	1200	1.34	34.0	0	0
Clevis	Eye	1400	.34	8.6	-.15	-.007

For configurations not shown contact Ohio Brass.

Most Common End Fittings



FITTING TYPE	SML k-LB (kN)	ANSI CLASS	DIMENSIONS IN. (mm)			
			A	B	C	D
CHAIN EYE	25 (111) - 30 (133)	-	0.62	1.00	2.00	0.62
	50 (222)	-	0.75	1.00	2.00	0.85
BALL & SOCKET	25 (111) - 30 (133)	52-5	0.73	1.29	-	-
	50 (222)	52-11	0.92	1.63	-	-
Y-CLEVIS	25 (111) - 30 (133)	-	0.75	1.53	-	-
	50 (222)	-	0.88	1.59	-	-
CLEVIS	25 (111) - 30 (133)	52-6	0.62	0.75	1.50	1.10

* For IEC 16mm and 20mm Ball and Socket fittings, contact Ohio Brass.

Hi*Lite XL Suspension Insulators: Key to the Catalog Numbers

5 1 1 0 1 2 1 2 0 1

Hi*Lite XL

Strength
1 = 25K SML
5 = 30K SML
3 = 50K SML

Construction
0 = Standard Hardware/0 Added Sheds
1 = Dull Hardware/0 Added Sheds
2 = Standard Hardware/2 Added Sheds
3 = Dull Hardware/2 Added Sheds

Weathershed Configuration
Number of sheds equals this number times four, plus any added sheds listed in the construction digit.

Line End Fittings
Chain Eye 00
ANSI Ball (1) 01
Y-Clevis 02
ANSI Socket (1) 03
ANSI Straight Clevis 04

Ground End Fittings
Chain Eye 0
ANSI Ball (1) 1
Y-Clevis 2
ANSI Socket (1) 3
ANSI Straight Clevis 4

Labeling
1 = English
2 = Metric (2)
R = English w/8" Corona Ring
W = English w/12" Corona Ring
T = English w/15" and 8" Corona Ring

(1) For IEC Ball and Socket fittings, contact Ohio Brass.
(2) Metric labeling of ANSI, or IEC insulators.