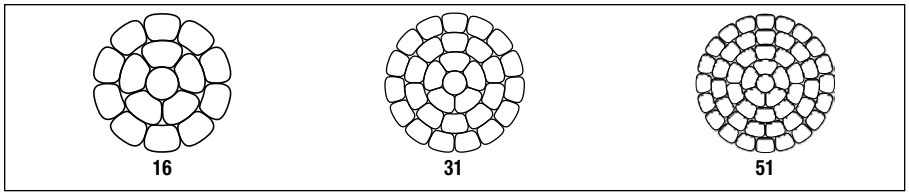
TransPowr® AAC/TW Bare Overhead Conductor

Trapezoidal All-Aluminum 1350 Concentric-Lay-Stranded



Product Construction:

Complete Conductor:

TransPowr® AAC/TW is a trapezoidal 1350 H19 aluminum (AAC) concentric-lay-stranded conductor. The aluminum strands are trapezoidal in shape. The wedge-shaped aluminum strands enable a more compact alignment of the aluminum wires.

Conductor designs that maintain the same circular mil cross-sectional area of aluminum as a conventional round conductor result in a TW conductor that is 10 to 15 percent smaller in overall diameter.

Conductor designs that maintain the same overall diameter as a conventional round conductor result in a TW conductor that has 20 to 25 percent more aluminum cross-sectional area packed in.

The AAC/TW conductors are manufactured in accordance with the requirements of the latest issue of ASTM B778.

The conductor consists of two, three, four or five layers of aluminum 1350-H19 wires. The sizes and constructions listed on this and the following pages are examples used in overhead lines.

Features and Benefits:

TransPowr AAC/TW has a continuous operating temperature rating of 75°C. Operation of the conductor at elevated temperatures may increase the conductor sag properties and lower the rated tensile strength of the conductor.

AAC/TW conductors constructed of equivalent aluminum circular mil cross-sectional area provide a conductor that is smaller in overall diameter than the equivalent conventional round wire AAC conductor. The reduced conductor diameter is advantageous in reducing the effects of ice and wind loading on the conductor.

AAC/TW conductors constructed to be equivalent overall diameter enable a greater circular mil cross-sectional area of aluminum within the conductor, reducing power loss in the conductor for day-to-day operations as well as allowing a significant increase in conductor current-carrying capacity.

Applications:

Trapezoidal 1350 H19 aluminum conductors (AAC/TW) are used for overhead transmission lines where design parameters do not require the higher strength or temperature ratings provided by ACSR, ACSS or other type conductors.

Electrical Parameters:

The electrical parameters for the trapezoidal AAC equivalent circular mil area and equivalent overall diameter conductors may be found in the last table of this section.

Options:

- E3X® surface coating (/E3X)
- High-conductivity aluminum (/HC) (62.2% IACS)
- Non-specular surface finish (/NS)

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AAC/TW CONDUCTORS (MECHANICAL PROPERTIES) - REDUCED DIAMETER - CONDUCTORS SIZED TO HAVE EQUIVALENT CIRCULAR MIL AREA TO REGULAR AAC								
CODE WORD	SIZE AWG OR kcmil	NO. OF AL WIRES	EQUIVALENT STRAND WIRE DIA. INCHES	FILL FACTOR	CROSS-SECTION SQ. INCHES	O.D. IN	APPROX. WEIGHT LB/KFT	RATED STRENGTH LBS
Tulip/AAC/TW	336.4	15	0.1498	90.3	0.2644	0.609	313.9	6020
Canna/AAC/TW	397.5	15	0.1628	91.5	0.3122	0.657	370.8	6970
Cosmos/AAC/TW	477.0	15	0.1783	92.5	0.3745	0.716	444.8	8360
Zinnia/AAC/TW	500.0	15	0.1826	92.7	0.3928	0.733	466.5	8770
Mistletoe/AAC/TW	556.5	15	0.1926	93.2	0.4370	0.771	519.0	9750
Meadowsweet/AAC/TW	600.0	15	0.2000	93.5	0.4712	0.799	559.6	10500
Orchid/AAC/TW	636.0	15	0.2059	93.8	0.4995	0.821	593.1	11100
Verbena/AAC/TW	700.0	15	0.2160	94.1	0.5497	0.86	652.7	12000
Nasturtium/AAC/TW	750.0	15	0.2236	94.4	0.5890	0.889	699.5	12900
Arbutus/AAC/TW	795.0	17	0.2163	93.1	0.6243	0.922	743.7	13600
Cockscomb/AAC/TW	900.0	28	0.1793	91.8	0.7070	0.987	844.4	15400
Magnolia/AAC/TW	954.0	28	0.1846	92.1	0.7494	1.014	895.0	16400
Hawkweed/AAC/TW	1000.0	28	0.1890	92.3	0.7855	1.037	938.2	17200
Bluebell/AAC/TW	1033.5	28	0.1921	92.4	0.8115	1.054	969.2	17700
Marigold/AAC/TW	1113.1	28	0.1994	92.7	0.8744	1.092	1044	19100
Hawthorn/AAC/TW	1192.5	28	0.2064	93.0	0.9368	1.128	1119	20500
Narcissus/AAC/TW	1272.0	28	0.2131	93.2	0.9987	1.164	1193	21400
Columbine/AAC/TW	1351.5	28	0.2197	93.4	1.0610	1.198	1268	22700
Carnation/AAC/TW	1431.0	28	0.2261	93.7	1.1240	1.232	1343	24000
Coreopsis/AAC/TW	1590.0	28	0.2383	94.0	1.2490	1.296	1492	26700
Jessamine/AAC/TW	1750.0	45	0.1972	92.2	1.3740	1.372	1648	29700
Cowslip/AAC/TW	2000.0	45	0.2108	92.8	1.5710	1.463	1884	33200

Dimensions and weights not designated minimum or maximum are nominal values and subject to manufacturing tolerances. In this context, weight means mass.

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AAC/TW CONDUCTORS (ELECTRICAL PROPERTIES) - REDUCED DIAMETER - CONDUCTORS SIZED TO HAVE EQUIVALENT CIRCULAR MIL AREA TO REGULAR AAC															
CODE WORD	SIZE AWG OR kcmil	NO. OF AL WIRES	EQUIVALENT STRAND WIRE DIA. INCHES	FILL FACTOR	CROSS-SECTION SQ. INCHES	O.D. IN	RESISTANCE (1) OHMS/KFT			AMPACITY @75°C (2)		GEOMETRIC MEAN RADIUS FT	INDUCTIVE REACTANCE OHM/KFT (3)	CAPACITIVE REACTANCE MEGAOHM/KFT (3)
							DC @20°C	AC @25°C	AC @75°C	STANDARD	E3X®			
Tulip/AAC/TW	336.4	15	0.1498	90.3	0.2644	0.609	0.0511	0.0523	0.0626	505	560	0.0195	0.0905	0.5756
Canna/AAC/TW	397.5	15	0.1628	91.5	0.3122	0.657	0.0433	0.0443	0.0530	555	620	0.0211	0.0887	0.5635
Cosmos/AAC/TW	477.0	15	0.1783	92.5	0.3745	0.716	0.0361	0.0370	0.0443	625	700	0.0230	0.0867	0.5501
Zinnia/AAC/TW	500.0	15	0.1826	92.7	0.3928	0.733	0.0344	0.0353	0.0422	640	720	0.0236	0.0861	0.5465
Mistletoe/AAC/TW	556.5	15	0.1926	93.2	0.4370	0.771	0.0309	0.0318	0.0380	685	770	0.0248	0.0850	0.5386
Meadowsweet/AAC/TW	600.0	15	0.2000	93.5	0.4712	0.799	0.0287	0.0295	0.0353	720	810	0.0257	0.0841	0.5330
Orchid/AAC/TW	636.0	15	0.2059	93.8	0.4995	0.821	0.0270	0.0279	0.0333	745	840	0.0264	0.0835	0.5286
Verbena/AAC/TW	700.0	15	0.2160	94.1	0.5497	0.860	0.0246	0.0254	0.0303	790	895	0.0277	0.0824	0.5214
Nasturtium/AAC/TW	750.0	15	0.2236	94.4	0.5890	0.889	0.0229	0.0237	0.0283	825	935	0.0286	0.0817	0.5162
Arbutus/AAC/TW	795.0	17	0.2163	93.1	0.6243	0.922	0.0217	0.0225	0.0268	855	970	0.0296	0.0809	0.5106
Cockscomb/AAC/TW	900.0	28	0.1793	91.8	0.7070	0.987	0.0192	0.0201	0.0239	925	1050	0.0318	0.0792	0.4999
Magnolia/AAC/TW	954.0	28	0.1846	92.1	0.7494	1.014	0.0181	0.0190	0.0226	955	1090	0.0327	0.0786	0.4956
Hawkweed/AAC/TW	1000.0	28	0.1890	92.3	0.7855	1.037	0.0173	0.0182	0.0216	985	1125	0.0335	0.0780	0.4921
Bluebell/AAC/TW	1033.5	28	0.1921	92.4	0.8115	1.054	0.0167	0.0176	0.0209	1005	1150	0.0340	0.0777	0.4896
Marigold/AAC/TW	1113.1	28	0.1994	92.7	0.8744	1.092	0.0155	0.0164	0.0195	1050	1205	0.0352	0.0769	0.4841
Hawthorn/AAC/TW	1192.5	28	0.2064	93.0	0.9368	1.128	0.0145	0.0154	0.0182	1095	1255	0.0364	0.0761	0.4789
Narcissus/AAC/TW	1272.0	28	0.2131	93.2	0.9987	1.164	0.0136	0.0145	0.0172	1135	1310	0.0376	0.0754	0.4741
Columbine/AAC/TW	1351.5	28	0.2197	93.4	1.0610	1.198	0.0128	0.0137	0.0162	1180	1360	0.0387	0.0747	0.4695
Carnation/AAC/TW	1431.0	28	0.2261	93.7	1.1240	1.232	0.0121	0.0130	0.0154	1220	1405	0.0398	0.0741	0.4651
Coreopsis/AAC/TW	1590.0	28	0.2383	94.0	1.2490	1.296	0.0109	0.0119	0.0140	1295	1500	0.0418	0.0730	0.4572
Jessamine/AAC/TW	1750.0	45	0.1972	92.2	1.3740	1.372	0.00993	0.0110	0.0129	1370	1590	0.0443	0.0716	0.4482
Cowslip/AAC/TW	2000.0	45	0.2108	92.8	1.5710	1.463	0.00869	0.00987	0.0115	1475	1720	0.0473	0.0701	0.4382

(1) Based on a conductivity of 61.2% (minimum lot average) IACS at 20°C. To convert to ohms/mile, multiply by 5.28. To convert of ohms/km, multiply by 3.281.
(2) Based on a conductor temperature of 75°C at 60 Hz and the following conditions: 25°C ambient temperature, 2 ft/sec crosswind (90° to conductor), 0.5 coefficient of emissivity for a standard conductor and 0.9 for a E3X coated conductor, 0.5 coefficient of absorptivity for a standard conductor and 0.2 for a E3X coated conductor, 30° northern latitude, sea level elevation, 90° azimuth of line (East-West), clear atmosphere, and a date and time of noon on July 1 (resulting in 96.0 W/ft^2 of solar and radiated heat). Actual ampacity will differ based on local conditions. For specific ampacities, please contact your General Cable sales representative.
(3) Values for inductive reactance and capacitive reactance are expressed in terms of a 1 ft radius.

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AAC/TW CONDUCTORS (MECHANICAL PROPERTIES) - EQUIVALENT DIAMETER - CONDUCTORS SIZED TO HAVE EQUIVALENT DIAMETER TO REGULAR AAC								
CODE WORD	SIZE AWG OR kcmil	NO. OF AL WIRES	EQUIVALENT STRAND WIRE DIA. INCHES	FILL FACTOR	CROSS-SECTION SQ. INCHES	O.D. IN	APPROX. WEIGHT LB/KFT	RATED STRENGTH LBS
Logan/AAC/TW	322.5	15	0.1466	90.0	0.2532	0.60	300.7	5770
- none -	384.5	15	0.1601	91.3	0.3020	0.65	358.6	6740
Wheeler/AAC/TW	449.4	15	0.1731	92.1	0.3530	0.70	419.2	7880
- none -	521.7	15	0.1865	92.9	0.4098	0.75	486.6	9150
Robson/AAC/TW	595.8	15	0.1993	93.5	0.4679	0.80	555.7	10400
- none -	678.2	15	0.2126	94.0	0.5325	0.85	632.3	11600
McKinley/AAC/TW	761.5	15	0.2253	94.5	0.5980	0.90	710.2	13100
- none -	854.2	15	0.2386	94.8	0.6707	0.95	796.5	14700
Rainier/AAC/TW	918.8	28	0.1811	91.9	0.7212	1.00	861.4	15800
- none -	1020.0	28	0.1909	92.4	0.8014	1.05	957.2	17500
Helens/AAC/TW	1123.1	28	0.2003	92.8	0.8823	1.10	1054	19300
- none -	1234.2	28	0.2099	93.2	0.9689	1.15	1157	21200
Mazama/AAC/TW	1346.8	28	0.2193	93.4	1.0580	1.20	1263	22600
- none -	1467.9	28	0.2290	93.7	1.1530	1.25	1377	24700
Hood/AAC/TW	1583.2	34	0.2158	92.6	1.2440	1.30	1488	26600
- none -	1682.7	45	0.1934	92.1	1.3220	1.35	1585	28600
Whitney/AAC/TW	1812.7	45	0.2007	92.4	1.4240	1.40	1707	30800
- none -	1954.3	45	0.2084	92.7	1.5350	1.45	1841	33200
Powell/AAC/TW	2093.6	45	0.2157	92.9	1.6440	1.50	1972	34800
- none -	2245.4	45	0.2234	93.2	1.7640	1.55	2115	37300
Jefferson/AAC/TW	2388.1	46	0.2278	93.2	1.8770	1.60	2252	39700

Dimensions and weights not designated minimum or maximum are nominal values and subject to manufacturing tolerances. In this context, weight means mass.

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AAC/TW CONDUCTORS (ELECTRICAL PROPERTIES) - EQUIVALENT DIAMETER - CONDUCTORS SIZED TO HAVE EQUIVALENT DIAMETER TO REGULAR AAC

CODE WORD	SIZE AWG OR kcmil	NO. OF AL WIRES	EQUIVALENT STRAND WIRE DIA. INCHES	FILL FACTOR	CROSS-SECTION SQ. INCHES	O.D. IN	RESISTANCE (1) OHMS/KFT			AMPACITY @75°C (2)		GEOMETRIC MEAN RADIUS FT	INDUCTIVE REACTANCE OHM/KFT (3)	CAPACITIVE REACTANCE MEGAOHM/KFT (3)
							DC @20°C	AC @25°C	AC @75°C	STANDARD	E3X®			
Logan/AAC/TW	322.5	15	0.1466	90.0	0.2532	0.597	0.0533	0.0546	0.0653	490	545	0.0192	0.0908	0.5787
- none -	384.5	15	0.1601	91.3	0.3020	0.647	0.0447	0.0458	0.0548	545	610	0.0208	0.0890	0.5660
Wheeler/AAC/TW	449.4	15	0.1731	92.1	0.3530	0.696	0.0383	0.0393	0.0469	600	675	0.0224	0.0873	0.5545
- none -	521.7	15	0.1865	92.9	0.4098	0.747	0.0330	0.0339	0.0405	660	740	0.0240	0.0857	0.5434
Robson/AAC/TW	595.8	15	0.1993	93.5	0.4679	0.796	0.0289	0.0297	0.0355	715	805	0.0256	0.0842	0.5335
- none -	678.2	15	0.2126	94.0	0.5325	0.847	0.0254	0.0262	0.0313	775	875	0.0273	0.0828	0.5238
McKinley/AAC/TW	761.5	15	0.2253	94.5	0.5980	0.896	0.0226	0.0234	0.0279	835	945	0.0288	0.0815	0.5151
- none -	854.2	15	0.2386	94.8	0.6707	0.947	0.0201	0.0209	0.0249	895	1015	0.0305	0.0802	0.5063
Rainier/AAC/TW	918.8	28	0.1811	91.9	0.7212	0.996	0.0188	0.0197	0.0234	935	1065	0.0321	0.0790	0.4984
- none -	1020.0	28	0.1909	92.4	0.8014	1.047	0.0170	0.0178	0.0212	995	1140	0.0338	0.0778	0.4906
Helens/AAC/TW	1123.1	28	0.2003	92.8	0.8823	1.097	0.0154	0.0163	0.0193	1055	1210	0.0354	0.0768	0.4834
- none -	1234.2	28	0.2099	93.2	0.9689	1.147	0.0140	0.0149	0.0177	1115	1285	0.0370	0.0758	0.4764
Mazama/AAC/TW	1346.8	28	0.2193	93.4	1.0580	1.196	0.0128	0.0138	0.0163	1175	1355	0.0386	0.0748	0.4698
- none -	1467.9	28	0.2290	93.7	1.1530	1.247	0.0118	0.0128	0.0150	1240	1430	0.0403	0.0738	0.4632
Hood/AAC/TW	1583.2	34	0.2158	92.6	1.2440	1.304	0.0109	0.0120	0.0140	1295	1500	0.0420	0.0729	0.4563
- none -	1682.7	45	0.1934	92.1	1.3220	1.347	0.0103	0.0114	0.0134	1340	1555	0.0435	0.0720	0.4512
Whitney/AAC/TW	1812.7	45	0.2007	92.4	1.4240	1.396	0.00958	0.0107	0.0125	1400	1625	0.0451	0.0712	0.4456
- none -	1954.3	45	0.2084	92.7	1.5350	1.447	0.00889	0.0101	0.0117	1460	1700	0.0468	0.0704	0.4399
Powell/AAC/TW	2093.6	45	0.2157	92.9	1.6440	1.496	0.00830	0.00952	0.0110	1515	1770	0.0483	0.0696	0.4347
- none -	2245.4	45	0.2234	93.2	1.7640	1.547	0.00774	0.00901	0.0104	1575	1840	0.0500	0.0688	0.4294
Jefferson/AAC/TW	2388.1	46	0.2278	93.2	1.8770	1.597	0.00727	0.00859	0.00990	1630	1910	0.0517	0.0681	0.4244

(1) Based on a conductivity of 61.2% (minimum lot average) IACS at 20°C. To convert to ohms/mile, multiply by 5.28. To convert of ohms/km, multiply by 3.281.
(2) Based on a conductor temperature of 75°C at 60 Hz and the following conditions: 25°C ambient temperature, 2 ft/sec crosswind (90° to conductor), 0.5 coefficient of emissivity for a standard conductor and 0.9 for a E3X coated conductor, 0.5 coefficient of absorptivity for a standard conductor and 0.2 for a E3X coated conductor, 30° northern latitude, sea level elevation, 90° azimuth of line (East-West), clear atmosphere, and a date and time of noon on July 1 (resulting in 96.0 W/ft² of solar and radiated heat). Actual ampacity will differ based on local conditions. For specific ampacities, please contact your General Cable sales representative.
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