

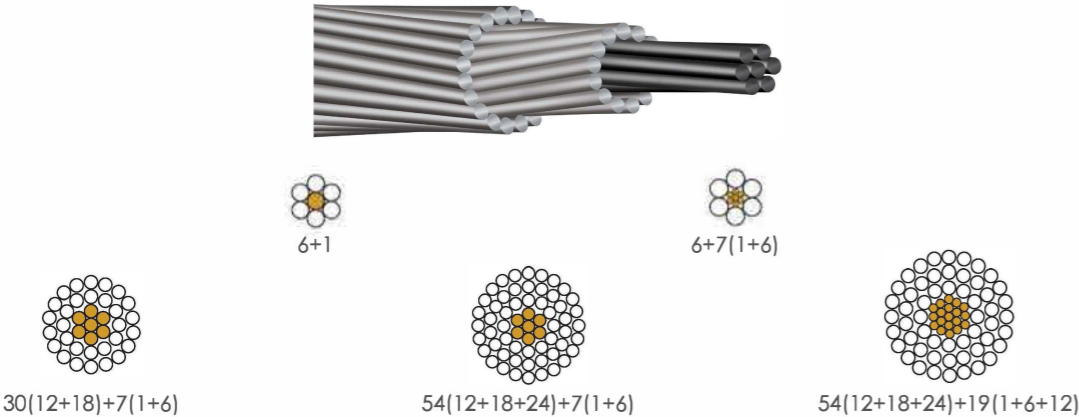
# Aluminium Conductors Steel Reinforced (Type ACSR/GZ)



ACSR conductors are a composite, concentrically stranded conductor consisting of a single galvanised steel wire or a stranded galvanised steel central core surrounded with one or more layers of EC grade (alloy 1350) stranded aluminium wires. The combination of the light weight and good conductivity of the aluminium and the high tensile strength of steel in the conductor design make ACSR conductors the most economical solution for overhead high tension transmission lines with an established reputation for dependability under adverse weather conditions.

The illustration below shows typical standard sizes and stranding patterns. The wires in all bare conductors are stranded with each successive layer having an opposite direction of lay, the outermost layer being right-handed.

For installations that require increased corrosion protection ACSR conductors incorporating an aluminium-clad steel central core can be supplied.



## Aluminium conductors, galvanized steel reinforced manufactured to AS 3607 (ACSR). Physical and Mechanical Properties

Conductor code	Stranding and wire diameter No/mm		Nominal Overall diameter mm	Cross sectional area mm <sup>2</sup>	Approximate mass kg/km	Minimum breaking load kN	Modulus of elasticity GPa	Coefficient of linear expansion x10 <sup>-6</sup> /°C
	Aluminum	Steel						
Almond	6/2.50	1/2.5	7.5	34.4	119	10.5	83	19.3
Apricot	6/2.75	1/2.75	8.3	41.6	144	12.6	83	19.3
Apple	6/3.00	1/3.00	9.0	49.5	171	14.9	83	19.3
Banana	6/3.75	1/3.75	11.3	77.3	268	22.7	83	19.3
Cherry	6/4.75	7/1.60	14.3	120	402	33.4	80	19.9
Grape	30/2.50	7/2.50	17.5	182	677	63.5	88	18.4
Lemon	30/3.00	7/3.00	21.0	262	973	90.4	88	18.4
Lychee	30/3.25	7/3.25	22.8	307	1140	105	88	18.4
Lime	30/3.50	7/3.50	24.5	356	1320	122	88	18.4
Mango	54/3.00	7/3.00	27.0	431	1440	119	78	19.9
Orange	54/3.25	7/3.25	29.3	506	1690	137	78	19.9
Olive	54/3.50	7/3.50	31.5	587	1960	159	78	19.9
Pawpaw	54/3.75	19/2.25	33.8	672	2240	178	77	20.0
Quince	3/1.75	4/1.75	5.3	16.8	95	12.7	136	13.9
Raisin	3/2.50	4/2.50	7.5	34.4	195	24.4	136	13.9
Sultana	4/3.00	3/3.00	9.0	49.5	243	28.3	119	15.2
Walnut	4/3.75	3/3.75	11.3	77.3	380	43.9	119	15.2

## Electrical Properties

Conductor code	DC resist at 20°C Ω/km	AC Resist at 50Hz 75°C Ω/km	Inductive reactance to 0.3m at 50Hz Ω/km	Continuous current carrying capacity, A											
				Rural weathered						Industrial weathered					
				Winter night			Summer noon			Winter night			Summer noon		
				still air	1m/s wind	2m/s wind	still air	1m/s wind	2m/s wind	still air	1m/s wind	2m/s wind	still air	1m/s wind	2m/s wind
Almond	0.975	1.32	0.295	114	195	219	85	172	203	121	195	228	81	166	202
Apricot	0.805	1.07	0.291	126	211	252	97	192	229	135	221	252	90	188	218
Apple	0.677	0.909	0.284	144	235	279	110	210	255	149	249	286	97	214	243
Banana	0.433	0.583	0.272	192	314	365	145	284	336	222	325	371	132	272	318
Cherry	0.271	0.366	0.256	262	415	492	195	369	444	289	441	499	177	368	428
Grape	0.196	0.264	0.241	335	515	605	242	454	539	372	525	628	215	444	528
Lemon	0.136	0.165	0.223	448	686	789	311	593	702	495	705	816	272	571	695
Lychee	0.116	0.143	0.220	490	768	885	349	668	787	559	795	917	302	529	766
Lime	0.100	0.124	0.218	551	838	975	383	711	852	613	874	1018	333	690	828
Mango	0.0758	0.0957	0.213	652	961	1158	445	828	1002	723	1012	1192	394	794	974
Orange	0.0646	0.0815	0.208	736	1058	1293	499	903	1123	806	1123	1328	429	872	1082
Olive	0.0557	0.0706	0.203	811	1172	1448	556	989	1238	896	1235	1475	467	940	1203
Pawpaw	0.0485	0.0617	0.197	896	1275	1559	601	1078	1358	985	1348	1628	512	1018	1325
Quince	3.25	4.35	0.345	52	94	107	40	83	99	57	96	119	42	82	98
Raisin	1.59	2.13	0.326	84	148	171	65	132	159	95	152	177	60	130	154
Sultana	0.897	1.20	0.300	121	209	232	92	180	220	135	211	248	85	177	213
Walnut	0.573	0.771	0.287	160	258	311	123	245	289	177	280	321	113	235	288

Note: Current ratings are based to the following conditions

- Conductor temperature rise above ambient of 40°C
  - Ambient air temp. of 35°C for summer noon or 10°C for winter night
  - Direct solar radiation intensity of 1000W/m<sup>2</sup> for summer noon or zero for winter night
  - Diffuse solar radiation intensity of 100W/m<sup>2</sup> for summer noon or zero for winter night
  - Ground reflectance of 0.2
  - Emissivity of 0.5 for rural weathered conductor or 0.85 for industrial weathered conductor
  - Solar absorption coefficient of 0.5 for rural weathered conductor or 0.85 for industrial weathered conductor
- Cross sections not to scale