

ANCOR

MARINE GRADE™ PRODUCTS
A Lasting Solution.

FEATURES & BENEFITS

TECHNICAL DATA



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TINNED COPPER WIRE

INDIVIDUAL COPPER WIRE STRANDS ARE TINNED

- Resists corrosion from salt and moisture found in the marine environment.
- Lasts up to 10 times longer than non-tinned wire
- Better conductivity than bare copper wire

MANUFACTURED TO AMERICAN WIRE GAUGE SIZE

- Diameter of wire is 12% larger than automotive (SAE) wire
- Larger diameter wire has better current carrying capacity.

TYPE 3 STRANDING

- More flexible than Type 2 automotive grade (SAE) wire
- Easier to work with and resists stress fatigue from vibration
- Approximately 2/3 more stranding which equals better conductivity

MEET OR EXCEED ALL NATIONAL AND INTERNATIONAL STANDARDS

- No matter where you build, repair, or sell, all requirements are met

PROPRIETARY COMPOUND USED FOR WIRE INSULATION

- Resists salt water, battery acid, oil, gasoline, ultra-violet radiation, heat and abrasion
- Better cold bending ability, heat, shock, flame and chemical resistance than automotive grade wire.
- Insulation contains 20% more polymers to prevent scalloping and a flexibility



CONNECTORS & TERMINALS



PREMIUM NYLON INSULATION

- Won't split or crack like automotive grade vinyl (PVC) insulation
- Soft enough to crimp and extremely durable
- Resists water, oil, chemicals, acids and ultra-violet rays

MANUFACTURED FROM THE HIGHEST GRADE TIN PLATED ELECTROLYTIC COPPER

- Tinning provides greater corrosion resistance and better conductivity which equals less power loss

SEAMLESS BARREL CONSTRUCTION

- Prevents barrel from splitting and/or connection from loosening

TINNED BRASS FUNNEL ENTRY SLEEVE

- Provides secondary crimp location onto jacket of wire for added strain relief from vibration and flexing
- Prevent strands from splitting or cracking during insertion of wire

COLOR CODED NYLON INSULATION

- For safety and ease of identification

CONNECTOR COLOR CODES

AWG	COLOR
22 - 18	Red
16 - 14	Blue
12 - 10	Yellow



TINNED COPPER LUGS

MANUFACTURED FROM HEAVY DUTY ANNEALED COPPER

- Strong, durable product providing for maximum current flow
- Not manufactured from plumbing pipe like other lugs

100% TIN PLATED COPPER

- For corrosion resistance of moisture and salt found in the marine environment
- Better conductivity providing for better current flow and less power loss

SEAMLESS BARREL DESIGN

- Maximum strength when crimped
- Won't split, burst or punch through

CLOSED END DESIGN

- Seals out moisture which means that your cable stays dry and corrosion free

FUNNEL ENTRY FOR WIRE

- Prevents strands from splitting or cracking during insertion



ADHESIVE LINED HEAT SHRINK TUBING



HEAT ACTIVATED ADHESIVE LINING

- Creates water, oil and acid resistant seal preventing corrosion at the electrical connection
- Provides strain relief to connection
- Helps eliminate wire pull out

CROSS LINKED POLYOLEFIN

- Much stronger than other heat shrink tubing
- Resists ultra-violet rays

3:1 SHRINK RATIO

- Shrinks at 257F / 225C
- Operating temperature range of -40C to 110C
- Shrinks to 1/3 original size
- Covers broader range of product

FLAME RETARDANT

- Won't burn like other heat shrink tubing

SEMI-FLEXIBLE DESIGN

- Provides structural and strain relief yet remains soft



Battery Cable Tubing Specifications (3:1 ratio)

Size	Shrinks to	Wire Range (AWG)
3/4"	1/4"	8 - 2/0
19 mm	6.4 mm	8-62 mm ²
1"	3/8"	2 - 4/0
25.4 mm	9.5 mm	32-103 mm ²
1 - 1/2"	1/2"	4/0 - 500 MCM
38 mm	12.7 mm	103-253 mm ²

ADHESIVE LINED HEAT SHRINK TERMINALS



ADHESIVE LINED HEAT SHRINK SLEEVE

- Shrinks to provide environmentally sealed connection
- Seal resists water, oil, chemicals and acids
- Provides vibration and strain relief



NYLON INSULATOR

- Helps eliminate wire pull out
- Won't split or crack like vinyl (PVC) insulated connectors
- Durable and resistant to cut through damage
- Resistant to ultra-violet radiation

BRAZED SEAM

- Grips wire in barrel to help prevent wire pull-out
- Provides for uniform crimping pressure across connection

TINNED COPPER

- Reduces overheating and provides for excellent current flow
- Resists corrosion from moisture and salt found in the marine environment
- Better electrical conductivity than bare copper

NYLON CABLE TIES AND CLAMPS

MADE FROM 100% PURE NYLON 6/6

- Provides longer life than recycled nylon products.
- Resistant to salt, acids and chemical solvents
- Black is resistant to ultra-violet radiation

DOUBLE LOCK™ HEAD DESIGN

- Dual teeth on top and bottom of locking head provide 50% more strength than other cable ties

BENT TIP DESIGN

- Easy to insert end into locking head
- Easier to grip end of tie

SELF ALIGNING NYLON CABLE CLAMPS

- Stronger construction than conventional clamps
- Quicker assembly than common clamps ensuring ends are aligned without user intervention
- 100% pure nylon provides longer life than recycled nylon



MARINE GRADE LAMPS

- NICKEL PLATED BRASS BASE
- For superior corrosion resistance and positive contacts
- HEAVY DUTY GLASS ENVELOPE
- For superior corrosion resistance and positive contacts
- ROUGH SERVICE FILAMENTS
- Adds break resistance
- Less chance for breakage
- FROSTED STANDARD BASE LAMPS
- Reduce glare
- Provide “soft” lighting

NOW OFFERING MANY LED BULBS!!



TECHNICAL INFORMATION

Table C: Conductor Sizes

AWG	Sq. mm	AWG CM area	SAE CM area	Ampacity Engine Space	
				Outside	Inside
18	0.8	1,600	1,537	20	17
16	1	2,600	2,336	25	21
14	2	4,100	3,702	35	30
12	3	6,500	5,833	45	38
10	5	10,500	9,343	60	51
8	8	16,800	14,810	80	68
6	13	26,600	24,538	120	102
4	21	42,000	37,360	160	136
2	34	66,500	62,450	210	178
1	42	83,690	77,790	245	208
1/0	53	105,600	98,980	285	242
2/0	68	133,100	125,100	330	280
3/0	85	167,800	158,600	385	327
4/0	107	211,600	205,500	445	378

Conductors Sized (AWG) for 3% Voltage Drop

Use 3% voltage drop for any "critical application" affecting the safety of the vessel or its passengers: bilge pumps, navigation lights, electronics, etc....

IMPORTANT!

Length (feet): Determined by measuring the length of the conductor from the positive (+) power source connection to the electrical device and back to the negative (-) power source connection. Note that the power source connection may be either the battery, panelboard or switchboard.

Current (amps): Determined by adding the total amps on a circuit.

Conductor sizes not covered in Table A or Table B may be calculated by using the following formula:

$$CM = \frac{K \times I \times L}{E}$$

After calculating the Circular Mil Area (CM), use Table D to determine the proper conductor size (National Fire Protection Agency and Coast Guard require that the next larger conductor be used when the calculated CM area falls between the two conductor sizes).

CM = Circular Mil Area of Conductors
K = 10.75 (Constant representing the mil-foot resistance of copper)
I = Current - amps / L = Length - feet
E = Voltage drop at load (in volts)

For Example...

Q: A bilge pump draws 10 amps. The positive run is 11 feet from the power panel, including the float switch. The negative run is only 10 feet. What size is the wire?

A: Use the formula to reach the correct answer:

Table C shows that 12 AWG wire has a CM area of 6,500 and is the correct choice. However, SAE wire has a CM area of only 5,833. Under NFPA and USCG regulations, 10 SAE wire must be used.

Length	Current (amps)												
	5	10	15	20	25	30	40	50	60	70	80	90	100
10'	18	14	12	10	10	8	6	6	6	6	4	4	4
15'	16	12	10	10	8	8	6	6	4	4	4	2	2
20'	14	10	10	8	6	6	6	4	4	2	2	2	2
25'	12	10	8	6	4	4	4	2	2	2	2	1	1
30'	12	10	8	6	6	6	4	4	2	2	2	1	1
40'	10	8	6	6	4	4	2	2	1	0	0	2/0	2/0
50'	10	6	6	4	4	2	2	1	0	2/0	3/0	4/0	4/0
60'	10	6	6	4	2	2	1	0	2/0	3/0	3/0	4/0	4/0
70'	8	6	4	2	2	1	0	2/0	3/0	3/0	4/0	4/0	4/0
80'	8	6	4	2	2	1	0	2/0	3/0	4/0	4/0		
90'	8	4	2	2	1	0	2/0	3/0	4/0	4/0			
100'	6	4	2	2	1	0	2/0	3/0	4/0				
110'	6	4	2	2	1	0	2/0	3/0	4/0				
120'	6	4	2	1	0	2/0	3/0	4/0					
130'	6	2	2	1	0	2/0	3/0	4/0					
140'	6	2	2	1/0	2/0	3/0	4/0						
150'	6	2	1	0	2/0	3/0	4/0						
160'	6	2	1	0	2/0	3/0	4/0						
170'	6	2	1	2/0	3/0	3/0	4/0						

Length	Current (amps)												
	5	10	15	20	25	30	40	50	60	70	80	90	100
10'	18	18	16	14	12	12	10	10	10	8	8	8	6
15'	18	16	14	12	12	10	10	8	8	6	6	6	6
20'	18	14	12	10	10	10	8	6	6	6	6	4	4
25'	16	12	12	10	10	8	6	6	6	4	4	4	4
30'	16	12	10	10	8	8	6	6	4	4	4	2	2
40'	14	10	10	8	6	6	6	4	4	2	2	2	2
50'	12	10	8	6	6	6	4	4	2	2	2	1	1
60'	12	10	8	6	6	4	4	2	2	1	1	0	0
70'	12	8	6	6	4	4	2	2	1	1	0	0	2/0
80'	10	8	6	6	4	4	2	2	1	0	0	2/0	2/0
90'	10	8	6	4	4	2	2	1	0	0	2/0	2/0	3/0
100'	10	6	6	4	4	2	2	1	0	2/0	2/0	3/0	3/0
110'	10	6	6	4	2	2	1	0	0	2/0	3/0	3/0	4/0
120'	10	6	4	4	2	2	1	0	2/0	3/0	3/0	4/0	4/0
130'	8	6	4	2	2	2	1	0	2/0	3/0	3/0	4/0	4/0
140'	8	6	4	2	2	1	0	2/0	3/0	3/0	4/0	4/0	4/0
150'	8	6	4	2	2	1	0	2/0	3/0	3/0	4/0	4/0	4/0
160'	8	6	4	2	2	1	0	2/0	3/0	4/0	4/0	4/0	4/0
170'	8	6	2	2	1	1	2/0	3/0	3/0	4/0	4/0		

Length	Current (amps)												
	5	10	15	20	25	30	40	50	60	70	80	90	100
10'	18	18	16	16	14	14	12	12	10	10	8	8	8
15'	18	16	14	14	12	12	10	10	8	8	8	6	6
20'	18	16	12	12	12	10	10	8	8	6	6	6	6
25'	18	14	12	12	10	10	8	8	6	6	6	6	4
30'	16	14	10	10	10	8	8	6	6	6	4	4	4
40'	16	12	10	10	8	8	6	6	4	4	4	2	2
50'	14	12	8	8	8	6	6	4	4	2	2	2	2
60'	14	10	8	8	6	6	4	4	2	2	2	2	1
70'	12	10	6	6	6	6	4	2	2	2	1	1	0
80'	12	10	6	6	6	4	4	2	2	1	1	0	0
90'	12	8	6	6	6	4	2	2	2	1	0	0	2/0
100'	12	8	6	6	4	4	2	2	1	0	0	2/0	2/0
110'	10	8	6	6	4	4	2	2	1	0	0	2/0	2/0
120'	10	8	6	4	4	2	2	1	0	0	2/0	2/0	3/0
130'	10	8	6	4	4	2	2	1	0	2/0	2/0	3/0	3/0
140'	10	6	6	4	2	2	1	0	0	2/0	3/0	3/0	3/0
150'	10	6	6	4	2	1	1	0	2/0	2/0	3/0	3/0	4/0
160'	10	6	4	4	2	1	1	0	2/0	3/0	3/0	4/0	4/0
170'	8	6	4	2	2	1	1	0	2/0	3/0	3/0	4/0	4/0

Conductors Sized (AWG) for 10% Voltage Drop

Use 10% voltage drop for any “non-critical applications: windlass, cabin lights, etc....

Length	Current (amps)												10% VOLTAGE DROP AT 12 VOLTS												
	5	10	15	20	25	30	40	50	60	70	80	90	100	5	10	15	20	25	30	40	50	60	70	80	90
10'	18	18	18	16	16	14	14	12	12	10	10	10	10												
15'	18	18	16	14	14	12	12	10	10	8	8	8	8												
20'	18	16	14	14	12	12	10	10	8	8	6	6	6												
25'	18	16	14	12	12	10	10	8	8	6	6	6	6												
30'	18	14	12	12	10	10	8	8	6	6	6	6	4												
40'	16	14	12	10	10	8	8	6	6	4	4	4	4												
50'	16	12	10	10	8	8	6	6	4	4	4	2	2												
60'	14	12	10	8	8	6	6	4	4	2	2	2	2												
70'	14	10	8	8	6	6	6	4	2	2	2	2	1												
80'	14	10	8	8	6	6	4	4	2	2	2	1	1												
90'	12	10	8	6	6	6	4	4	2	2	1	1	0												
100'	12	10	8	6	6	4	4	2	2	1	1	0	0												
110'	12	8	8	6	6	4	2	2	2	1	0	0	0												
120'	12	8	6	6	4	4	2	2	1	1	0	0	2/0												
130'	12	8	6	6	4	4	2	2	1	0	0	2/0	2/0												
140'	10	8	6	6	4	2	2	1	1	0	2/0	2/0	2/0												
150'	10	8	6	4	4	2	2	1	0	0	2/0	2/0	3/0												
160'	10	8	6	4	4	2	2	1	0	2/0	2/0	3/0	3/0												
170'	10	6	6	4	2	2	2	1	0	2/0	2/0	3/0	3/0												

Length	Current (amps)												10% VOLTAGE DROP AT 24 VOLTS												
	5	10	15	20	25	30	40	50	60	70	80	90	100	5	10	15	20	25	30	40	50	60	70	80	90
10'	18	18	18	18	18	18	16	16	14	14	14	14	12												
15'	18	18	18	18	16	16	14	14	12	12	12	12	10												
20'	18	18	18	16	16	14	14	12	12	10	10	10	10												
25'	18	18	16	16	14	14	12	12	10	10	10	8	8												
30'	18	18	16	14	14	12	12	10	10	8	8	8	8												
40'	18	16	14	14	12	12	10	10	8	8	8	6	6												
50'	18	16	14	12	12	10	10	8	8	6	6	6	6												
60'	18	14	12	12	10	10	8	8	6	6	6	6	4												
70'	16	14	12	10	10	8	8	6	6	6	6	4	4												
80'	16	14	12	10	10	8	8	6	6	6	4	4	4												
90'	16	12	10	10	8	8	6	6	6	4	4	4	2												
100'	16	12	10	10	8	8	6	6	4	4	4	2	2												
110'	14	12	10	8	8	8	6	6	4	4	2	2	2												
120'	14	12	10	8	8	6	6	4	4	2	2	2	2												
130'	14	12	10	8	8	6	6	4	4	2	2	2	2												
140'	14	10	8	8	6	6	6	4	2	2	2	2	1												
150'	14	10	8	8	6	6	4	4	2	2	2	2	1												
160'	14	10	8	8	6	6	4	4	2	2	2	1	1												
170'	12	10	8	6	6	6	4	2	2	2	2	1	1												

Length	Current (amps)												10% VOLTAGE DROP AT 32 VOLTS												
	5	10	15	20	25	30	40	50	60	70	80	90	100	5	10	15	20	25	30	40	50	60	70	80	90
10'	18	18	18	18	18	18	18	16	16	14	14	14	14												
15'	18	18	18	18	18	18	16	14	14	14	14	12	12												
20'	18	18	18	18	16	16	14	14	12	12	12	10	10												
25'	18	18	18	16	16	14	14	12	12	10	10	10	10												
30'	18	18	18	16	14	14	12	14	10	10	10	10	8												
40'	18	18	16	14	14	12	12	10	10	8	8	8	8												
50'	18	16	14	14	12	12	10	10	8	8	8	6	6												
60'	18	16	14	12	12	10	10	8	8	8	6	6	6												
70'	18	14	14	12	10	10	8	8	6	6	6	6	6												
80'	18	14	12	12	10	10	8	8	6	6	6	6	4												
90'	18	14	12	10	10	10	8	6	6	6	6	4	4												
100'	16	14	12	10	10	8	8	6	6	6	4	4	4												
110'	16	14	12	10	10	8	8	6	6	6	4	4	4												
120'	16	12	10	10	8	8	6	6	6	4	4	4	2												
130'	16	12	10	10	8	8	6	6	6	4	4	2	2												
140'	14	12	10	8	8	8	6	6	4	4	2	2	2												
150'	14	12	10	8	8	6	6	6	4	4	2	2	2												
160'	14	12	10	8	8	6	6	4	4	2	2	2	2												
170'	14	12	10	8	8	6	6	4	4	2	2	2	2												

Temperature Rating of Conductor Insulation

It's The Law

The Code of Federal Regulations (CFR) 183.425 Conductors

- (b) Except for intermittent surges each conductor must not carry a current greater than that specified in Table E for the conductor's gauge and temperature rating.
- (c) For conductors in engine spaces, amperages must be corrected by the appropriate correction factor in note 1 of Table E.

Due to engine heat, the ambient temperature in engine spaces is usually higher than in other spaces of the boat. Wiring in and passing through engine spaces must be able to operate at these higher ambient temperatures. The ampacity values in Table D are based on an ambient temperature of 30° C (86° F) which is considered reasonable for use on boats except in engine spaces. The correction factors in Note 1 in Table D convert the ampacities to Table D to acceptable values in an ambient temperature of 50° C (122° F). This higher temperature has been selected as satisfactory for engine spaces. Note 1 is supplied to eliminate the need for calculating the corrections to Table D. The values are already corrected.

Conductor Size (AWG)	Ampacity Outside of Engine Space	Ampacity Inside of Engine Space (Note 1)
18	20	17
16	25	21
14	35	30
12	45	38
10	60	51
8	80	68
6	120	102
4	160	136
3	180	153
2	210	178
1	245	208
1/0	285	242
2/0	330	280
3/0	385	327
4/0	445	378

*De-rating for engine space is 0.85 for 105° C (221° F) rated wire.

Allowable Amperage of Conductors of 50 Volts or More

The current values shown in Table E and also on Table C do not consider voltage drop for conductors under 50 volts. The values shown on the ampacity table are the maximum safe amperages which the conductor can carry on a continuous basis. They do not apply to intermittent starting loads such as motor start currents. Since all ANCOR Boat Cable is 105° C insulated, only that temperature rating is shown.

Due to the higher ambient temperatures in engine spaces and the heat retention of large wire bundles, a "correction factor" must be used to derate the wire by increasing conductor size. Table E takes into consideration these factors and should be used to select conductor sizes for circuits over 50 volts. Note that for electrical systems under 50 volts, voltage drop is the controlling factor and the tables on pages 9 and 10 should be used.

Conductor Size (AWG)	2 Conductors 105° C (221° F)		3 Conductors 105° C (221° F)		4 to 6 Conductors 105° C (221° F)		7 to 24 Conductors 105° C (221° F)	
	Outside Engine Space	Inside Engine Space	Outside Engine Space	Inside Engine Space	Outside Engine Space	Inside Engine Space	Outside Engine Space	Inside Engine Space
18	20	17.0	14.0	11.9	12.0	10.2	10.0	8.5
16	25	21.3	17.5	14.9	15.0	12.8	12.5	10.6
14	35	29.8	24.5	20.8	21.0	17.9	17.5	14.9
12	45	38.3	31.5	26.8	27.0	23.0	22.5	19.1
10	60	51.0	42.0	35.7	36.0	30.6	30.0	25.5
8	80	68.0	56.0	47.6	48.0	40.8	40.0	34.0
6	120	102.0	84.0	71.4	72.0	61.2	60.0	51.0
4	160	136.0	112.0	95.2	96.0	81.6	80.0	68.0
3	180	153.0	126.0	107.1	108.0	91.8	90.0	76.5
2	210	178.5	147.0	125.0	126.0	107.1	105.0	89.3
1	245	208.3	171.5	145.8	147.0	125.0	122.5	104.1
1/0	285	242.3	199.5	169.6	171.0	145.4	142.5	121.1
2/0	330	280.5	231.0	196.4	198.0	168.3	165.0	140.3
3/0	385	327.3	269.5	229.1	231.0	196.4	192.5	163.6
4/0	445	378.3	311.5	264.8	267.0	227.0	222.5	189.1

Table E is supplied to eliminate the need for calculating the corrections for multi-conductor cable bundles to Table D. The values are already corrected.

Number of current carrying conductors:	Correction Factor
3	0.70
4 to 6	0.60
7 to 24	0.50
25 and above	0.40

- Note: These tables only apply for 105° C (221° F) wire and other premium wire and should not be used for lesser grades of wire and cable.
- Reprinted at the courtesy of the United States Coast Guard Electrical System Compliance Guideline.