

Coaxial Cable



Corporate Profile

Velocity Technology Industries is a young, potent & dynamic growing company. Despite its humble beginnings, the company has been dedicated to establishing a professional relationship with its clients and setting an example in this field by providing the cutting-edge technological solutions while assuring high quality products and maintaining a remarkable record of market reputation. Backed up with its state-of the-art design and manufacturing technologies, we are able to stay in line with the changing market trend by being innovative through our continuous effort in research and development, to meet the ever increasing market demand.

Velocity has been working intensively to achieve its goal of maximizing the localization of products and intends to provide a one stop shopping experience for its local and regional customers.

Through the clear vision and entrepreneur spirit of our Managing Director, we have focused on developing long term relationships with our customers, suppliers and especially our employees. By being honest, reliable and trustworthy, we have succeeded in helping our customers to achieve product satisfaction towards our goods and services provided. We have implemented stringent quality control system to monitor the production line and finished products so as to assure our customers with only top quality and uniformity of our products.

We are a company that will overcome all difficulties and as such has committed ourselves to being flexible. With your support, we will be able to realize our vision. The best is yet to be.

MIL-C-17 is the government specification document used to standardize Coaxial cables; it has been in use since the 1940's. In the many revisions made to MIL-C-17 over the years, the familiar RG part numbers were superseded by M17 part number during the 1970's. The most recent and therefore applicable revision to MIL-C-17 is revision G.

All information presented in this catalogue is solely intended as a guide to product selection and are believed to be reliable. All printing errors are subject to correction prior to release of this catalogue. Velocity has taken precautions to ensure accuracy of product specifications for all Velocity products. Specifications for all Velocity products are subject to change without prior notice.

Velocity does not warrant the suitability of its products for a particular use. In no case will Velocity be liable for any indirect, incidental or consequential damages arising from the use or sale of Velocity products. Velocity products are manufactured in accordance to MIL-spec. MIL-C-17G / JAN-C-17



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Coaxial Cable

CATV, MATV and Analog / Digital Applications

Product Construction:

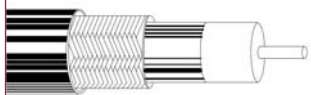
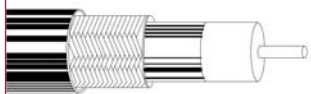


Refer to individual product description

Applications:

- Closed circuit TV
- CATV
- MATV
- Drop Cable
- Broadcast

Packing Details:

1000ft (305m)
1640ft (500m)
3278ft (1000m)
Available on spools and reels

CATALOG NUMBER	AWG SIZE NOM. DCR (Dia. in Inch)	INSULATION CORE		SHIELD COVERAGE NOM. DCR	SHEATH		NOMINAL CAPACITANCE pF/ft	VELOCITY OF PROPAGATION %	NOMINAL IMPEDANCE	NOMINAL ATTENUATION		
		INCHES	MM		NOMINAL OD.					MHz	dB/100ft	dB/100m
					INCHES	MM						
 V00620D RG6/U	18 (Solid) 0.040 Bare Copper Covered Steel	Gas Injected Foam Polyethylene		100% H-foil 61% Tinned Copper Braid	Black PVC		16.70	82	75	1	0.18	0.59
										10	0.35	1.15
										50	1.40	4.59
										100	2.05	6.73
										200	2.86	9.38
										400	3.93	12.89
										700	5.18	16.99
										900	5.88	19.29
1000	6.25	20.51										
 V00620DL RG6/U	18 (Solid) 0.040 Bare Copper Covered Steel	Gas Injected Foam Polyethylene		100% H-foil 61% Tinned Copper Braid	LSHF		16.70	82	75	1	0.18	0.59
										10	0.35	1.15
										50	1.40	4.59
										100	2.05	6.73
										200	2.86	9.38
										400	3.93	12.89
										700	5.18	16.99
										900	5.88	19.29
1000	6.25	20.51										
 V00620DBC RG6/U	18 (Solid) 0.040 Bare Copper 6.4 Ω/M	Gas Injected Foam Polyethylene		100% H-foil 95% Tinned Copper Braid	Black PVC		16.10	82	75	1	0.24	0.80
										10	0.72	2.40
										50	1.60	5.40
										100	2.10	6.95
										200	3.00	9.93
										400	3.70	12.21
										700	5.30	17.60
										1000	6.20	20.50
 V00620DBCL RG6/U	18 (Solid) 0.040 Bare Copper 6.4 Ω/M	Gas Injected Foam Polyethylene		100% H-foil 95% Tinned Copper Braid	LSHF		16.10	82	75	1	0.24	0.80
										10	0.72	2.40
										50	1.60	5.40
										100	2.10	6.95
										200	3.00	9.93
										400	3.70	12.21
										700	5.30	17.60
										1000	6.20	20.50

*LSHF = Low Smoke Halogen Free

Transmission and Computer Application

Product Construction:

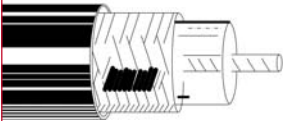
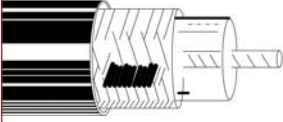
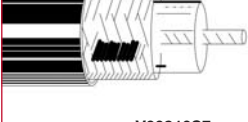
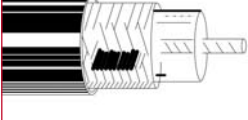
Refer to individual product description

Applications:

- Suitable for RF signal transmission
- Local Area Network
- Broadcast
- Amateur Radio

Packing Details:

1000ft (305m)
 1640ft (500m)
 3278ft (1000m)
 Available on spools and reels

CATALOG NUMBER	AWG SIZE NOM. DCR (Dia. in Inch)	INSULATION CORE		SHIELD COVERAGE NOM. DCR	SHEATH		NOMINAL CAPACITANCE pF/ft	VELOCITY OF PROPAGATION %	NOMINAL IMPEDANCE	NOMINAL ATTENUATION		
		INCHES	MM		INCHES	MM				MHz	dB/100ft	dB/100m
 V00810S RG8A/U MIL-C-17D	13 (7 x 21) 0.085 Bare Copper 1.9 Ω/M	Solid Polyethylene		97% Bare Copper Braid 1.22 Ω/M	Black Non-Contaminating PVC		28	66	52	1	0.17	0.60
		0.285	7.24		0.405	10.30				10	0.55	1.80
										50	1.30	4.30
										100	1.90	6.30
										200	2.71	8.90
										400	4.10	13.40
										700	6.50	21.30
										900	7.60	24.90
										1000	8.00	26.20
										4000	21.50	70.50
 V00810SL RG8A/U MIL-C-17D	13 (7 x 21) 0.085 Bare Copper 1.9 Ω/M	Solid Polyethylene		97% Bare Copper Braid 1.22 Ω/M	LSHF		28	66	52	1	0.17	0.60
		0.285	7.24		0.405	10.30				10	0.55	1.80
										50	1.30	4.30
										100	1.90	6.30
										200	2.71	8.90
										400	4.10	13.40
										700	6.50	21.30
										900	7.60	24.90
										1000	8.00	26.20
										4000	21.50	70.50
 V00810S7 RG8/U	13 (7 x 21) 0.085 Bare Copper 1.87 Ω/M	Solid Polyethylene		70% Bare Copper Braid 3.7 Ω/M	Black PVC		32	66	50	50	1.90	6.23
		0.285	7.24		0.405	10.30				100	2.20	7.21
										200	3.30	10.82
										400	5.30	17.38
 V00810S7L RG8/U	13 (7 x 21) 0.085 Bare Copper 1.87 Ω/M	Solid Polyethylene		70% Bare Copper Braid 3.7 Ω/M	LSHF		32	66	50	50	1.90	6.23
		0.285	7.24		0.405	10.30				100	2.20	7.21
										200	3.30	10.82
										400	5.30	17.38

*LSHF = Low Smoke Halogen Free



Coaxial Cable

CATV, MATV Applications

Product Construction:

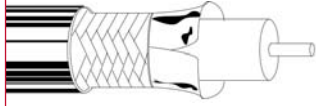

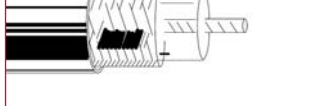
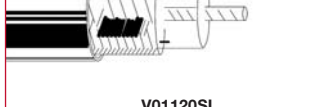
Refer to individual product description

Applications:

- Standard Analog Video
- Drop Cable
- MATV
- CATV
- Broadcast

Packing Details:

1000ft (305m)
1640ft (500m)
3278ft (1000m)
Available on spools and reels

CATALOG NUMBER	AWG SIZE NOM. DCR (Dia. in Inch)	INSULATION CORE		SHIELD COVERAGE NOM. DCR	SHEATH		NOMINAL CAPACITANCE pF/ft	VELOCITY OF PROPAGATION %	NOMINAL IMPEDANCE	NOMINAL ATTENUATION		
		INCHES	MM		NOMINAL OD.					MHz	dB/100ft	dB/100m
					INCHES	MM						
 V01120DBC RG11/U	14 (Solid) 0.064 Bare Copper 2.6 Ω/M	Foam Polyethylene		100% H-foil 61% Tinned Copper Braid 3 Ω/M	Black PVC		17.3	78	75	1	0.17	0.60
										10	0.50	1.60
										50	1.00	3.30
										100	1.40	4.60
										200	2.10	6.90
										400	2.90	9.50
										700	3.90	12.80
										900	4.40	14.40
										1000	4.70	15.40
										 V01120DBC L RG11/U	14 (Solid) 0.064 Bare Copper 2.6 Ω/M	Foam Polyethylene
10	0.50	1.60										
50	1.00	3.30										
100	1.40	4.60										
200	2.10	6.90										
400	2.90	9.50										
700	3.90	12.80										
900	4.40	14.40										
1000	4.70	15.40										
 V01120S RG11/U MIL-C-17G	18 (7 x 26) 0.048 Tinned Copper 6.1 Ω/M	Solid Polyethylene		97% Bare Copper Braid 1.24 Ω/M	Black Non- Contaminating PVC		21.0	66	75			
										10	0.75	2.46
										50	1.40	4.59
										100	2.10	6.80
										200	3.00	9.80
										400	4.30	14.10
										700	5.90	19.30
										900	6.90	22.60
										1000	7.20	23.30
										 V01120SL RG11/U MIL-C-17G	18 (7 x 26) 0.048 Tinned Copper 6.1 Ω/M	Solid Polyethylene
10	0.75	2.46										
50	1.40	4.59										
100	2.10	6.80										
200	3.00	9.80										
400	4.30	14.10										
700	5.90	19.30										
900	6.90	22.60										
1000	7.20	23.30										

*LSHF = Low Smoke Halogen Free



CATV, MATV Applications

Product Construction:

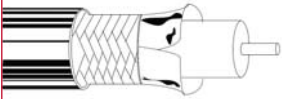
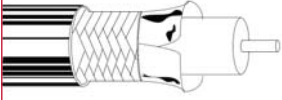
Refer to individual product description

Applications:

- Standard Analog Video
- Drop Cable
- MATV
- CATV
- Broadcast

Packing Details:

1000ft (305m)
 1640ft (500m)
 3278ft (1000m)
 Available on spools and reels

CATALOG NUMBER	AWG SIZE NOM. DCR (Dia. in Inch)	INSULATION CORE		SHIELD COVERAGE NOM. DCR	SHEATH		NOMINAL CAPACITANCE pF/ft	VELOCITY OF PROPAGATION %	NOMINAL IMPEDANCE	NOMINAL ATTENUATION		
		INCHES	MM		INCHES	MM				MHz	dB/100ft	dB/100m
 V01120D RG11/U	14 (Solid) 0.064 Bare Copper Covered Steel 11.0 Ω/M	Gas Injected Foam Polyethylene		100% H-foil 40% Aluminium Braid 5.3 Ω/M	Black PVC		16.2	82	75	1	0.30	1.00
		10	0.60		2.00							
		50	0.90		3.00							
		100	1.20		3.90							
		200	1.70		5.60							
		400	2.40		7.90							
		700	3.50		11.50							
100% Sweep Tested @ Frequency Band 5-1000 MHZ										900	3.80	12.50
100% Sweep Tested @ Frequency Band 5-1000 MHZ										1000	4.00	13.10
 V01120DL RG11/U	14 (Solid) 0.064 Bare Copper Covered Steel 11.0 Ω/M	Gas Injected Foam Polyethylene		100% H-foil 40% Aluminium Braid 5.3 Ω/M	LSHF		16.2	82	75	1	0.30	1.00
		10	0.60		2.00							
		50	0.90		3.00							
		100	1.20		3.90							
		200	1.70		5.60							
		400	2.40		7.90							
		700	3.50		11.50							
100% Sweep Tested @ Frequency Band 5-1000 MHZ										900	3.80	12.50
100% Sweep Tested @ Frequency Band 5-1000 MHZ										1000	4.00	13.10

*LSHF = Low Smoke Halogen Free



Coaxial Cable

Broadcast / Computer Application

Product Construction:

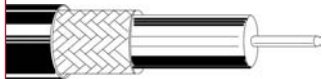
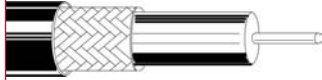

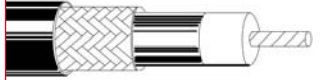
Refer to individual product description

Applications:

- Suitable for RF signal transmission
- Computer
- Broadcast

Packing Details:

1000ft (305m)
1640ft (500m)
3278ft (1000m)
Available on spools and reels

CATALOG NUMBER	AWG SIZE NOM. DCR (Dia. in Inch)	INSULATION CORE		SHIELD COVERAGE NOM. DCR	SHEATH		NOMINAL CAPACITANCE pF/ft	VELOCITY OF PROPAGATION %	NOMINAL IMPEDANCE	NOMINAL ATTENUATION		
		INCHES	MM		INCHES	MM				MHz	dB/100ft	dB/100m
 V05810S RG58/U JAN-C-17A	20 (Solid) 0.033 Bare Copper 10.0 Ω/M	Solid Polyethylene		95% Tinned Copper Braid 4.11 Ω/M	Black PVC		29	66	53.5	1	0.40	1.31
		0.116	2.95		0.193	4.90				10	1.10	3.61
										50	2.60	8.35
										100	3.80	12.47
										200	5.60	18.37
										400	8.40	27.56
										700	11.80	38.71
900	13.70	44.95										
1000	14.50	47.57										
 V05810SL RG58/U JAN-C-17A	20 (Solid) 0.033 Bare Copper 10.0 Ω/M	Solid Polyethylene		95% Tinned Copper Braid 4.11 Ω/M	LSHF		29	66	53.5	1	0.40	1.31
		0.116	2.95		0.193	4.90				10	1.10	3.61
										50	2.60	8.35
										100	3.80	12.47
										200	5.60	18.37
										400	8.40	27.56
										700	11.80	38.71
900	13.70	44.95										
1000	14.50	47.57										
 V05810D RG58A/U	20 (19 x 32) 0.037 Tinned Copper 8.8 Ω/M	Foam Polyethylene		100% H-foil 55% Tinned Copper Braid 17.0 Ω/M	Black PVC		26.5	73	52	1	0.37	1.21
		0.114	2.90		0.193	4.90				10	1.41	4.30
										50	3.20	9.20
										100	4.52	13.30
										200	6.40	18.70
										400	9.51	31.20
										700	13.50	44.50
900	15.50	50.90										
1000	16.00	52.60										
 V05810DL RG58A/U	20 (19 x 32) 0.037 Tinned Copper 8.8 Ω/M	Foam Polyethylene		100% H-foil 55% Tinned Copper Braid 17.0 Ω/M	LSHF		26.5	73	52	1	0.37	1.21
		0.114	2.90		0.193	4.90				10	1.41	4.30
										50	3.20	9.20
										100	4.52	13.30
										200	6.40	18.70
										400	9.51	31.20
										700	13.50	44.50
900	15.50	50.90										
1000	16.00	52.60										

*LSHF = Low Smoke Halogen Free

Broadcast and Closed Circuit TV

Product Construction:

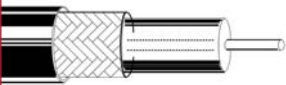
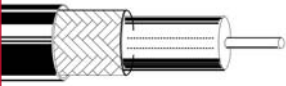
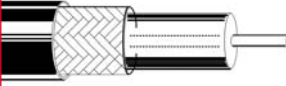
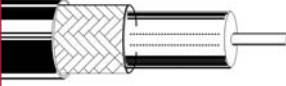
Refer to individual product description

Applications:

- Suitable for RF signal transmission
- Standard Analog Video
- Closed Circuit TV

Packing Details:

1000ft (305m)
 1640ft (500m)
 3278ft (1000m)
 Available on spools and reels

CATALOG NUMBER	AWG SIZE NOM. DCR (Dia. in Inch)	INSULATION CORE		SHIELD COVERAGE NOM. DCR	SHEATH		NOMINAL CAPACITANCE pF/ft	VELOCITY OF PROPAGATION %	NOMINAL IMPEDANCE	NOMINAL ATTENUATION		
		INCHES	MM		INCHES	MM				MHz	dB/100ft	dB/100m
 V05920S RG59/U MIL-C-17G	23 (Solid) 0.023 Bare Copper Covered Steel 47 Ω/M	Solid Polyethylene		96% Bare Copper Braid 2.6 Ω/M	Black Non-Contaminating PVC		20	66	75	1	0.60	1.97
		10	1.10		3.61							
		50	2.40		7.87							
		100	3.40		11.15							
		200	5.00		16.40							
		400	7.10		23.29							
		700	9.80		32.15							
900	11.20	36.75										
1000	12.10	39.70										
 V05920SL RG59/U MIL-C-17G	23 (Solid) 0.023 Bare Copper Covered Steel 47 Ω/M	Solid Polyethylene		96% Bare Copper Braid 2.6 Ω/M	LSHF		20	66	75	1	0.60	1.97
		10	1.10		3.61							
		50	2.40		7.87							
		100	3.40		11.15							
		200	5.00		16.40							
		400	7.10		23.29							
		700	9.80		32.15							
900	11.20	36.75										
1000	12.10	39.70										
 V05920S9 RG59/U	23 (Solid) 0.023 Bare Copper Covered Steel 47 Ω/M	Solid Polyethylene		95% Bare Copper Braid 2.6 Ω/M	PVC		20.5	66	75	1	0.60	2.00
		10	1.10		3.60							
		50	2.40		7.90							
		100	3.40		11.20							
		200	4.90		16.10							
		400	7.00		23.00							
		700	9.70		31.80							
900	11.10	36.40										
1000	12.00	39.40										
 V05920S9L RG59/U	23 (Solid) 0.023 Bare Copper Covered Steel 47 Ω/M	Solid Polyethylene		95% Bare Copper Braid 2.6 Ω/M	LSHF		20.5	66	75	1	0.60	2.00
		10	1.10		3.60							
		50	2.40		7.90							
		100	3.40		11.20							
		200	4.90		16.10							
		400	7.00		23.00							
		700	9.70		31.80							
900	11.10	36.40										
1000	12.00	39.40										

*LSHF = Low Smoke Halogen Free



Coaxial Cable

Broadcast and Close Circuit TV

Product Construction:

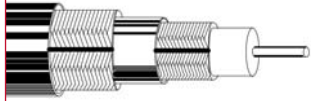
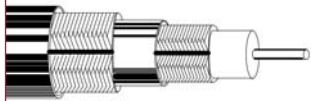
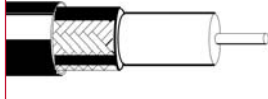
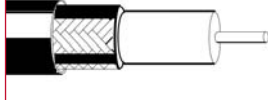
Refer to individual product description

Applications:

- Suitable for RF signal transmission
- Standard Analog Video
- Broadcast

Packing Details:

1000ft (305m)
1640ft (500m)
3278ft (1000m)
Available on spools and reels

CATALOG NUMBER	AWG SIZE NOM. DCR (Dia. in Inch)	INSULATION CORE		SHIELD COVERAGE NOM. DCR	SHEATH		NOMINAL CAPACITANCE pF/ft	VELOCITY OF PROPAGATION %	NOMINAL IMPEDANCE	NOMINAL ATTENUATION		
		INCHES	MM		INCHES	MM				MHz	dB/100ft	dB/100m
 V05920T RG59/U TRIAXIAL CABLE	20 (Solid) 0.032 Bare Copper Covered Steel 34.5 Ω/M	Foam Polyethylene		2 Bare Copper 95% Shield Coverage Inner 2.5 Ω/M Outer 2.8 Ω/M	Black Polyethylene		17.5	78	75	1	0.60	2.00
		0.143	3.63		10	1.00				3.30		
					50	2.10				6.90		
					100	3.00				9.80		
					200	4.50				14.80		
					400	6.60				21.60		
					700	8.90				29.20		
900	10.10	33.10										
1000	10.90	35.80										
Polyethylene insulation Between Braids 100% Sweep tested @ 5-300MHZ												
 V05920TL RG59/U TRIAXIAL CABLE	20 (Solid) 0.032 Bare Copper Covered Steel 34.5 Ω/M	Foam Polyethylene		2 Bare Copper 95% Shield Coverage Inner 2.5 Ω/M Outer 2.8 Ω/M	LSHF		17.5	78	75	1	0.60	2.00
		0.143	3.63		10	1.00				3.30		
					50	2.10				6.90		
					100	3.00				9.80		
					200	4.50				14.80		
					400	6.60				21.60		
					700	8.90				29.20		
900	10.10	33.10										
1000	10.90	35.80										
Polyethylene insulation Between Braids 100% Sweep tested @ 5-300MHZ												
 V05920BC RG59/U	20 (Solid) 0.032 Bare Copper 10.0 Ω/M	Foam Polyethylene		Bare Copper Braid 95% Shield Coverage 2.6 Ω/M	Black PVC		17.3	78	75	1	0.60	2.00
		0.146	3.71		10	1.00				3.30		
					50	1.91				6.23		
					100	2.70				8.90		
					200	3.90				12.80		
					400	5.60				18.40		
					500	6.30				20.70		
1000	9.11	29.83										
 V05920BCL RG59/U	20 (Solid) 0.032 Bare Copper 10.0 Ω/M	Foam Polyethylene		Bare Copper Braid 95% Shield Coverage 2.6 Ω/M	LSHF		17.3	78	75	1	0.60	2.00
		0.146	3.71		10	1.00				3.30		
					50	1.91				6.23		
					100	2.70				8.90		
					200	3.90				12.80		
					400	5.60				18.40		
					500	6.30				20.70		
1000	9.11	29.83										

*LSHF = Low Smoke Halogen Free

Computer / Video Application

Product Construction:

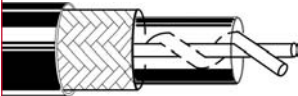
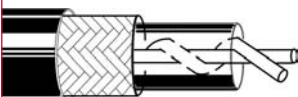
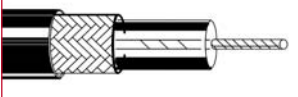
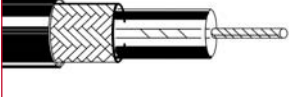
Refer to individual product description

Applications:

- Instrumentation
- Broadcast
- Local Area Network

Packing Details:

1000ft (305m)
 1640ft (500m)
 3278ft (1000m)
 Available on spools and reels

CATALOG NUMBER	AWG SIZE NOM. DCR (Dia. in Inch)	INSULATION CORE		SHIELD COVERAGE NOM. DCR	SHEATH NOMINAL OD.		NOMINAL CAPACITANCE pF/ft	VELOCITY OF PROPAGATION %	NOMINAL IMPEDANCE	NOMINAL ATTENUATION		
		INCHES	MM		INCHES	MM				MHz	dB/ 100ft	dB/ 100m
 V06230S RG62/U JAN-C-17A	22 (Solid) 0.025 Bare Copper Covered Steel 55 Ω/M	Semi-Solid Polyethylene		95% Bare Copper Braid 2.9 Ω/M	Black PVC		13.6	84	93	1	0.30	0.96
		10	0.90		2.88							
		50	1.90		6.23							
		100	2.70		8.86							
		200	3.80		12.47							
		400	5.30		17.39							
		700	7.30		23.95							
900	8.20	26.90										
1000	8.70	28.54										
 V06230SL RG62/U JAN-C-17A	22 (Solid) 0.025 Bare Copper Covered Steel 55 Ω/M	Semi-Solid Polyethylene		95% Bare Copper Braid 2.9 Ω/M	LSHF		13.6	84	93	1	0.30	0.96
		10	0.90		2.88							
		50	1.90		6.23							
		100	2.70		8.86							
		200	3.80		12.47							
		400	5.30		17.39							
		700	7.30		23.95							
900	8.20	26.90										
1000	8.70	28.54										
 V17410S RG174/U MIL-C-17F	26 (7 x 34) 0.019 Bare Copper Covered Steel 97 Ω/M	Solid Polyethylene		90% Tinned Copper Braid 10.3 Ω/M	Black PVC		30.0	66	50	1	1.90	6.23
		10	3.30		10.83							
		50	5.80		19.03							
		100	8.40		27.56							
		200	12.50		41.01							
		400	19.00		62.34							
		700	27.00		88.58							
900	31.00	101.71										
1000	34.00	111.55										
 V17410SL RG174/U MIL-C-17F	26 (7 x 34) 0.019 Bare Copper Covered Steel 97 Ω/M	Solid Polyethylene		90% Bare Copper Braid 10.3 Ω/M	LSHF		30.0	66	50	1	1.90	6.23
		10	3.30		10.83							
		50	5.80		19.03							
		100	8.40		27.56							
		200	12.50		41.01							
		400	19.00		62.34							
		700	27.00		88.58							
900	31.00	101.71										
1000	34.00	111.55										

*LSHF = Low Smoke Halogen Free



Transmission / Broadcast

Product Construction:

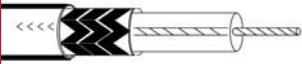
Refer to individual product description

Applications:

- Suitable for RF signal transmission
- Test and Data transmission
- Wireless
- High Temperature

Packing Details:

1000ft (305m)
 1640ft (500m)
 3278ft (1000m)
 Available on spools and reels

CATALOG NUMBER	AWG SIZE NOM. DCR (Dia. in Inch)	INSULATION CORE		SHIELD COVERAGE NOM. DCR	SHEATH		NOMINAL CAPACITANCE pF/ft	VELOCITY OF PROPAGATION %	NOMINAL IMPEDANCE	NOMINAL ATTENUATION		
		INCHES	MM		NOMINAL OD.					MHz	dB/100ft	dB/100m
					INCHES	MM						
 V17810S RG178B/U MIL-C-17G	30 (7 x 38) 0.012 Silver Coated Copper 244 Ω/M	Clear FEP		95% Silver Coated Copper Braid 14.6 Ω/M	Brown FEP Flame Test: VW-1		28	69.50	50	1	2.60	8.45
										50	10.50	34.44
										100	14.00	46.00
										400	28.00	92.00
										700	37.00	121.50
1000	46.20	151.53										

*LSHF = Low Smoke Halogen Free

Transmission and Computer Application

Product Construction:

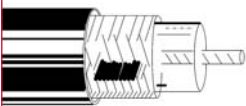
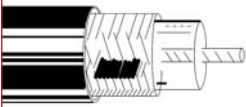
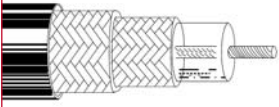
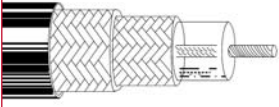
Refer to individual product description

Applications:

- Suitable for RF signal transmission
- CATV
- Local Area Network
- MATV

Packing Details:

1000ft (305m)
 1640ft (500m)
 3278ft (1000m)
 Available on spools and reels

CATALOG NUMBER	AWG SIZE NOM. DCR (Dia. in Inch)	INSULATION CORE		SHIELD COVERAGE NOM. DCR	SHEATH NOMINAL OD.		NOMINAL CAPACITANCE pF/ft	VELOCITY OF PROPAGATION %	NOMINAL IMPEDANCE	NOMINAL ATTENUATION		
		INCHES	MM		INCHES	MM				MHz	dB/100ft	dB/100m
 V21310S RG213/U MIL-C-17G	13 (7 x 21) 0.089 Bare Copper 1.7 Ω/M	Solid Polyethylene		97% Bare Copper Braid 1.2 Ω/M	Black Non-Contaminating PVC		30.80	66	50	1	0.18	0.59
		10	0.58		1.84							
		50	1.50		4.60							
		100	2.00		6.60							
		200	2.80		9.20							
		400	4.20		13.80							
		700	6.60		21.70							
900	7.70	25.30										
1000	8.10	26.60										
 V21310SL RG213/U MIL-C-17G	13 (7 x 21) 0.089 Bare Copper 1.7 Ω/M	Solid Polyethylene		97% Bare Copper Braid 1.2 Ω/M	LSHF		30.80	66	50	1	0.18	0.59
		10	0.58		1.84							
		50	1.50		4.60							
		100	2.00		6.60							
		200	2.80		9.20							
		400	4.20		13.80							
		700	6.60		21.70							
900	7.70	25.30										
1000	8.10	26.60										
 V21410D RG214/U MIL-C-17G	13 (7 x 21) 0.089 Silver Coated Copper 1.7 Ω/M	Solid Polyethylene		97% Two Silver Coated Copper Braids 0.70 Ω/M	Black Non-Contaminating PVC		30.80	66	50	1	0.17	0.56
		10	0.55		1.80							
		50	1.30		4.30							
		100	1.90		6.20							
		200	2.70		8.90							
		400	4.10		13.40							
		700	6.50		21.30							
900	7.60	24.90										
1000	8.00	26.20										
4000	20.00	65.60										
 V21410DL RG214/U MIL-C-17G	13 (7 x 21) 0.089 Silver Coated Copper 1.7 Ω/M	Solid Polyethylene		97% Two Silver Coated Copper Braids 0.70 Ω/M	LSHF		30.80	66	50	1	0.17	0.56
		10	0.55		1.80							
		50	1.30		4.30							
		100	1.90		6.20							
		200	2.70		8.90							
		400	4.10		13.40							
		700	6.50		21.30							
900	7.60	24.90										
1000	8.00	26.20										
4000	20.00	65.60										

*LSHF = Low Smoke Halogen Free



Transmission and High Temperature

Product Construction:

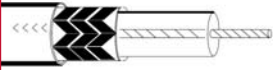
Refer to individual product description

Applications:

- Suitable for RF signal transmission
- CATV
- High Temperature
- Military and Commercial Industry

Packing Details:

1000ft (305m)
 1640ft (500m)
 3278ft (1000m)
 Available on spools and reels

CATALOG NUMBER	AWG SIZE NOM. DCR (Dia. in Inch)	INSULATION CORE		SHIELD COVERAGE NOM. DCR	SHEATH		NOMINAL CAPACITANCE pF/ft	VELOCITY OF PROPAGATION %	NOMINAL IMPEDANCE	NOMINAL ATTENUATION		
		INCHES	MM		NOMINAL OD.					MHz	dB/100ft	dB/100m
					INCHES	MM						
 V31610S RG316/U MIL-C-17G	25 (7 x 33) 0.020 Silver Coated Copper Covered Steel 84 Ω/M	Clear FEP		95% Silver Coated Copper Braid 6.5 Ω/M	Brown FEP Flame Test: VW-1		29.00	69.50	50	1	0.70	2.28
										10	2.12	6.98
										50	5.20	17.80
										100	7.50	24.58
										400	16.40	53.79
										700	22.90	75.18
1000	28.80	94.45										

*LSHF = Low Smoke Halogen Free

Transmission, CATV and Close Circuit TV

Product Construction:





Refer to individual product description

Applications:

- Suitable for RF signal transmission
- CATV
- High Frequency Equipment
- Closed Circuit TV
- Tele-communication

Packing Details:

1000ft (305m)
 1640ft (500m)
 3278ft (1000m)
 Available on spools and reels

CATALOG NUMBER	AWG SIZE NOM. DCR (Dia. in Inch)	INSULATION CORE		SHIELD COVERAGE NOM. DCR	SHEATH		NOMINAL CAPACITANCE pF/ft	VELOCITY OF PROPAGATION %	NOMINAL IMPEDANCE	NOMINAL ATTENUATION		
		INCHES	MM		NOMINAL OD.					MHz	dB/ 100ft	dB/ 100m
					INCHES	MM						
 V25228S 2.5C-2V	26 (Solid) 0.0159 Bare Copper	Solid Polyethylene		96% Bare Copper	Gray PVC		21.30	66	75	1	0.56	1.85
		0.094	2.40		10	1.60				5.20		
					50	3.59				11.80		
		Also available in: 4 Core: V25228S4 6 Core: V25228S6 8 Core: V25228S8	0.16		4.00	100				5.18	17.00	
						200				7.47	24.50	
						400				10.79	35.40	
						700				14.73	48.30	
900	16.92			55.50								
1000	17.99	59.00										
 V25228SL 2.5C-2V	26 (Solid) 0.0159 Bare Copper	Solid Polyethylene		96% Bare Copper	LSHF		21.30	66	75	1	0.56	1.85
		0.094	2.40		10	1.60				5.20		
					50	3.59				11.80		
		Also available in: 4 Core: V25228S4L 6 Core: V25228S6L 8 Core: V25228S8L	0.16		4.00	100				5.18	17.00	
						200				7.47	24.50	
						400				10.79	35.40	
						700				14.73	48.30	
900	16.92			55.50								
1000	17.99	59.00										
 V25229D 2.5C-2V	26 (Solid) 0.0159 Bare Copper	Solid Polyethylene		97% Bare Copper Inner 92% Bare Copper Outer	White / Black PVC		24	66	63	1	0.16	2.00
		0.077	1.95		10	1.68				5.50		
					50	3.72				12.20		
		Also available in: 4 Core: V25229D4 6 Core: V25229D6 8 Core: V25229D8	0.16		4.00	100				5.33	17.50	
						200				7.71	25.30	
						400				11.13	36.50	
						700				15.71	49.75	
900	17.38			57.00								
1000	18.60	61.00										
 V25229DL 2.5C-2V	26 (Solid) 0.0159 Bare Copper	Solid Polyethylene		97% Bare Copper Inner 92% Bare Copper Outer	LSHF		24	66	63	1	0.16	2.00
		0.077	1.95		10	1.68				5.50		
					50	3.72				12.20		
		Also available in: 4 Core: V25229D4L 6 Core: V25229D6L 8 Core: V25229D8L	0.16		4.00	100				5.33	17.50	
						200				7.71	25.30	
						400				11.13	36.50	
						700				15.71	49.75	
900	17.38			57.00								
1000	18.60	61.00										

*LSHF = Low Smoke Halogen Free



Coaxial Cable Theory

Introduction to coaxial cables

A coaxial cable is one that consists of two conductors that share a common axis. The inner conductor is typically a straight wire, either solid or stranded and the outer conductor is typically a shield that might be braided or a foil.

Coaxial cable is a cable type used to carry radio signals, video signals, measurement signals and data signals. Coaxial cable consists of an insulated center conductor which is covered with a shield. The signal is carried between the cable shield and the center conductor. This arrangement give quite good shielding against noise from outside cable, keeps the signal well inside the cable and keeps cable characteristics stable.

Coaxial cables are typically characterized with the impedance and cable loss. The length has nothing to do with a coaxial cable impedance. Characteristic impedance is determined by the size and spacing of the conductors and the type of dielectric used between them. For ordinary coaxial cable used at reasonable frequency, the characteristic impedance depends on the dimensions of the inner and outer conductors.

Most common coaxial cable impedances in use in various applications are 50 ohms and 75 ohms. 50 ohms cable is used in radio transmitter antenna connections, many measurement devices and in data communications (Ethernet). 75 ohms coaxial cable is used to carry video signals, TV antenna signals and digital audio signals. There are also other impedances in use in some special applications (for example 93 ohms). It is possible to build cables at other impedances, but those mentioned earlier are the standard ones that are easy to get.

Essential properties of coaxial cables are their characteristic impedance and its regularity, their attenuation as well as their behavior concerning the electrical separation of cable and environment, i.e. their screening efficiency. In applications where the cable is used to supply voltage for active components in the cabling system, the DC resistance has significance. Also the cable velocity information is needed on some applications. The coaxial cable velocity of propagation is defined by the velocity of the dielectric. It is expressed in percents of speed of light. Here is some data of come common coaxial cable insulation materials and their velocities:

Polyethylene (PE)	66%
Teflon	70%
Foam	78..86%

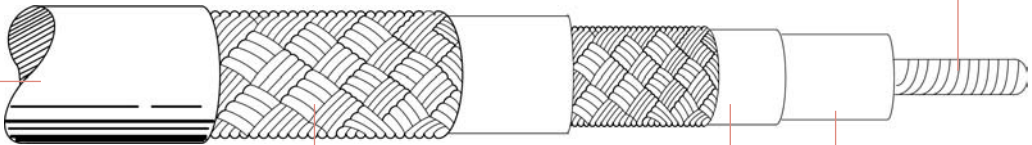
Return loss is one number which shows cable performance meaning how well it matches the nominal impedance. Poor cable return loss can show cable manufacturing defects and installation defects (cable damaged on installation). With a good quality coaxial cable in good condition you generally get better than -30 dB return loss and you should generally not got much worse than -20 dB. Return loss is same thing as VSWR term used in radio world, only expressed differently (15 dB return loss = 1.43:1 VSWR, 23 dB return loss = 1.15:1 VSWR etc.).

Cable Construction

Center Conductor

Conductors in coaxial cable are either solid or stranded wire. Solid conductors are described by their diameter and material (i.e. 18 AWG Solid TC) while stranded conductors include their stranding (i.e. 20 AWG (19x32 AWG) Strand TC).

- BC – Bare Copper
- SC – Silvered Copper
- TC – Tinned Copper
- CCA – Copper Clad Aluminum
- CCS – Copper Covered Steel



Jackets

Jacket material may vary depending on application. LSFH cables provide superior fire safety, while outdoor cables (specially those meant for burial) are usually sheathed in Polyethylene.

- PE – Polyethylene (Outdoor Applications)
- PVC – Polyvinylchloride

Shields

Coaxial shields (also called the outer conductor) come in several varieties. Two types of coverage are: Foil, where aluminum is bonded to both sides of a polypropylene or polyester tape to provide 100% coverage and Braid where flexible wire is woven around the dielectric. Braid coverage designation is given as a percentage followed by a two letter code representing the material of the braid (i.e. 96% TC braid would be 96% coverage of a Tin Copper braid).

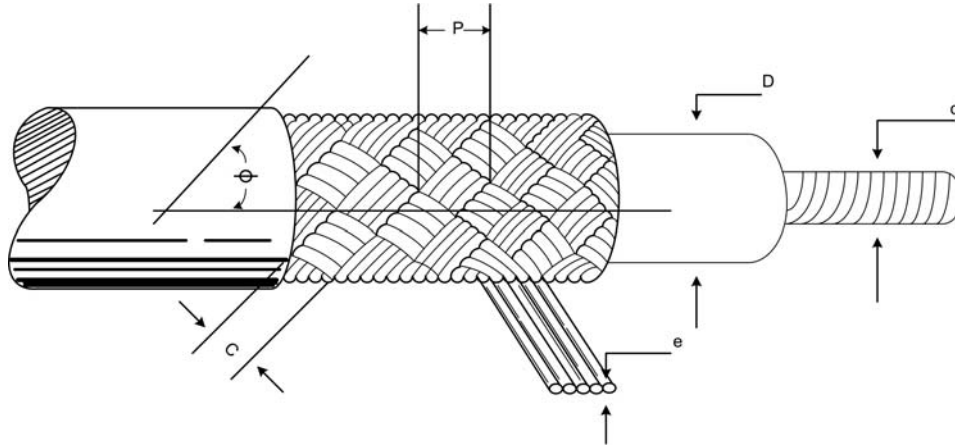
- AIS – Aluminum sheath
- Al – Aluminum braid
- BC – Bare Copper braid
- SC – Silver Copper braid
- TC – Tin Copper braid

Dielectric

Most Velocity coaxial cables have foamed (or cellular) dielectrics for better velocity of propagation characteristics. Different materials are used to meet electrical and fire-safety performance.

- Foam PE – Foamed Polyethylene
- Solid PE – Solid Polyethylene
- Foam FEP – Foamed Fluorinated Ethylene Propylene
- Solid FEP – Solid Fluorinated Ethylene Propylene
- AD/PE – Air Dielectric created with a Polyethylene filament
- FRPE – Flame-Retardant Polyethylene





BRAID ANGLE:

$$\theta = \tan^{-1} \left[\frac{2\pi(D + e) P}{C} \right], \text{ DEGREES}$$

BRAID PICKS PER INCH:

$$P = \frac{(C) (\tan \theta)}{2\pi (M)}, \text{ PICKS/INCH}$$

BRAID SHIELD WEIGHT:

$$W = \frac{(n) (c) (l)}{\cos \theta}, \text{ LBS/M FT}$$

BRAID SHIELD DC RESISTANCE:

$$R_{dc} = \frac{r_{dc}}{(n) (C) (\cos \theta)}, \Omega/\text{Mft}$$

Where:

- D = diameter under shield, inches
- d = diameter of center conductor, inches
- C = number of carriers
- e = diameter of end
- P = pick (measured in picks per linear inch)
- Ø = braid angle, degrees

- w = weight of shield, lbs/Mft
- n = number of ends in one carrier
- l = weight of one end in lbs/Mft
- M = D + build-up of braid on one shield wall, inches
- R_{dc} = dc resistance of the braid shield, Ω/Mft
- r_{dc} = dc resistance of one strand (end) of shield, Ω/Mft

Cable Design Equations - Coaxial Cable

Technical Information

COAXIAL CABLE CAPACITANCE: $C = \frac{7.36\epsilon}{\text{Log}\left(\frac{D}{d}\right)}, \text{ pF/ft}$

COAXIAL CABLE VELOCITY OF PROPAGATION: $V_p = \frac{100}{\epsilon^{1/2}}, \%$

COAXIAL CABLE INDUCTANCE: $L = 0.140 \text{ LOG}\left(\frac{D}{d}\right), \mu\text{H/ft}$

COAXIAL CABLE TIME DELAY: $t_d = 1.016 \epsilon^{1/2}, \text{ nsec/ft}$

COAXIAL CABLE IMPEDANCE: $Z_0 = \frac{138}{\epsilon^{1/2}} \text{ LOG}\left(\frac{D}{d}\right), \Omega$

COAXIAL CABLE CUTOFF FREQUENCY: $f_{co} = \frac{7.50}{\epsilon^{1/2} (D + d)}, \text{ GHz}$

Where:

C	= capacitance, pF/ft	Z_0	= characteristic impedance, Ω
ϵ	= insulation dielectric constant (see table below)	V_p	= velocity of propagation, %
D	= diameter under the shield, inches	t_d	= time delay, nsec/ft
d	= diameter of the center conductor, inches	f_{co}	= cutoff frequency, GHz
L	= inductance, $\mu\text{H/ft}$		

Material	Description	VOP%	E_T	Power Factor, PF
GIFPE	Gas Injected Foam Polyethylene	82	1.40	0.0002
PE	Solid Polyethylene	66	2.30	0.0003
FPE	Foamed Polyethylene	73	2.10	0.0003
SSPE	Semi-Solid Polyethylene	84	1.38	0.0002
FEP	Fluorinated Ethylene Propylene	70	2.10	0.0003

Solid Bare Copper Wire **AWG**

AWG Gauge	Diameter Inches	Diameter mm	Ohms per 1000 ft @ 68° F	Ohms per km @ 68° F	Weight Pounds per 1000 ft.
10	0.1019	2.58826	0.9989	3.276392	31.43
11	0.0907	2.30378	1.26	4.1328	24.92
12	0.0808	2.05232	1.588	5.20864	19.77
13	0.072	1.8288	2.003	6.56984	15.68
14	0.0641	1.62814	2.525	8.282	12.43
15	0.0571	1.45034	3.184	10.44352	9.858
16	0.0508	1.29032	4.016	13.17248	7.818
17	0.0453	1.15062	5.064	16.60992	6.200
18	0.0403	1.02362	6.385	20.9428	4.917
19	0.0359	0.91186	8.051	26.40728	3.899
20	0.032	0.8128	10.15	33.292	3.092
21	0.0285	0.7239	12.8	41.984	2.452
22	0.0254	0.64516	16.14	52.9392	1.945
23	0.0226	0.57404	20.36	66.7808	1.542
24	0.0201	0.51054	25.67	84.1976	1.223
25	0.0179	0.45466	32.37	106.1736	0.9699
26	0.0159	0.40386	40.81	133.8568	0.7692
27	0.0142	0.36068	51.47	168.8216	0.6100
28	0.0126	0.32004	64.9	212.872	0.4837
29	0.0113	0.28702	81.83	268.4024	0.3836
30	0.0100	0.254	103.2	338.496	0.3042
31	0.0089	0.22606	130.1	426.728	0.2413
32	0.008	0.2032	164.1	538.248	0.1913
33	0.0071	0.18034	206.9	678.632	0.1517
34	0.0063	0.16002	260.9	855.752	0.1203
35	0.0056	0.14224	329	1079.12	0.09542
36	0.0050	0.127	414.8	1360	0.07568
37	0.0045	0.1143	523.1	1715	0.0613
38	0.0040	0.1016	659.6	2163	0.04759
39	0.0035	0.0889	831.8	2728	0.03774
40	0.0031	0.07874	1049	3440	0.02993

Stranded Tinned Copper Wire **AWG**

Technical Information

AWG Gauge	Stranding	Nom. OD Strand	Approx. OD		Circular Mil Area	Wt. Per. 1000'	Ohms Per 1000'
			Inches	mm			
36	7/44	0.002	0.006	0.153	28.00	0.085	371.0
34	7/42	0.0025	0.0075	0.191	43.75	0.132	237.0
32	7/40	0.0031	0.008	0.203	67.27	0.203	164.0
32	19/44	0.002	0.009	0.229	76.00	0.230	136.4
30	7/38	0.004	0.012	0.305	112.00	0.339	103.2
30	19/42	0.0025	0.012	0.305	118.75	0.359	87.3
28	7/36	0.005	0.015	0.381	141.75	0.529	64.9
28	19/40	0.0031	0.016	0.406	182.59	0.553	56.7
27	7/35	0.0056	0.018	0.457	219.52	0.664	51.47
26	7/34	0.0063	0.019	0.483	277.83	0.841	37.3
26	10/36	0.0050	0.021	0.553	250.00	0.757	41.48
26	19/38	0.0040	0.020	0.508	304.00	0.920	34.43
24	7/32	0.008	0.024	0.610	448.00	1.356	23.3
24	10/34	0.0063	0.023	0.584	396.00	1.201	26.09
24	19/36	0.0050	0.024	0.610	475.00	1.430	21.08
24	41/40	0.0031	0.023	0.584	384.40	1.160	25.59
22	7/30	0.0100	0.030	0.762	700.00	2.120	14.74
22	19/34	0.0063	0.031	0.787	754.11	2.28	13.73
22	26/36	0.0050	0.030	0.762	650.00	1.97	15.94
20	10/30	0.0100	0.035	0.890	1000.00	3.025	10.32
20	19/32	0.0080	0.037	0.890	1216.00	3.68	8.63
20	26/34	0.0063	0.036	0.940	1031.94	3.12	10.05
20	42/36	0.0050	0.036	0.914	1025.00	3.10	10.02
18	7/26	0.0159	0.048	1.22	1769.60	5.36	5.86
18	16/30	0.0100	0.047	1.20	1600.00	4.84	6.48

AWG Gauge	Stranding	Nom. OD Strand	Approx. OD		Circular Mil Area	Wt. Per. 1000'	Ohms Per 1000'
			Inches	mm			
18	19/30	0.0100	0.049	1.24	1900.00	5.75	5.46
18	42/34	0.0063	0.047	1.20	1627.29	4.92	6.37
18	65/36	0.0050	0.047	1.20	1625.00	4.91	6.39
16	7/24	0.0201	0.060	1.52	2828.00	8.56	3.67
16	19/29	0.0113	0.058	1.47	2426.30	7.35	4.27
16	26/30	0.0100	0.059	1.50	2600.00	7.87	4.00
16	65/34	0.0063	0.059	1.50	2579.85	7.81	4.02
16	105/36	0.0050	0.059	1.50	2625.00	7.95	3.99
14	7/22	0.0253	0.073	1.85	4480.00	13.56	2.31
14	19/26	0.0142	0.073	1.85	3830.40	11.59	2.70
14	42/30	0.0100	0.073	1.85	4100.00	12.40	2.53
14	105/34	0.0063	0.073	1.85	4167.50	12.61	2.49
12	7/22	0.0320	0.096	2.44	7168.00	21.69	1.45
12	19/26	0.0179	0.093	2.36	6087.60	18.43	1.70
12	65/30	0.0100	0.095	2.41	6500.00	19.66	1.75
12	165/34	0.0063	0.095	2.41	6548.90	19.82	1.58
10	37/26	0.0159	0.115	2.92	9353.60	28.31	1.11
10	65/28	0.0142	0.116	2.95	9878.40	29.89	1.09
10	105/30	0.0100	0.116	2.95	10,530.00	31.76	0.98
8	49/25	0.0179	0.14	2.95	15,699.60	47.53	0.67
8	133/29	0.0113	0.147	3.73	16,984.10	51.42	0.61
8	655/36	0.0050	0.147	3.73	16,625.00	49.58	0.62
6	133/27	0.0142	0.184	4.67	26,812.80	81.14	0.47
6	259/30	0.0100	0.184	4.67	25,900.00	78.35	0.40
6	1050/36	0.0050	0.184	4.67	26,250.00	79.47	0.386



Glossary

Air Spaced Coaxial Cable - One in which air is the essential dielectric material. A spirally wound synthetic filament or spacer may be used to center the conductor.

Ambient - The atmospheric conditions surrounding a given item. Normally in terms of factors which influence or modify, such as temperature, humidity, etc.

Amplitude - The magnitude of variation in a changing quantity from its zero value. The word requires modification – as with adjectives such as peak, maximum, rms, etc. – to designate the specific amplitude in question.

Attenuation - Loss of signal strength as a function of distance. In optical fiber, it is the “dimming” of the light as it travels through the fiber expressed in decibels per unit (db/Km).

AWG - American Wire Gauge. A standard for determining wire size. The gauge varies inversely with the actual wire diameter.

Backbone - The part of the network that carries the heaviest traffic. It is the main trunk cable from which all connections to the network are made.

Balun (Balanced/Unbalanced) - An impedance matching device to connect balanced twisted pair cabling with unbalanced coaxial cable.

Bandwidth - The data-carrying capacity of a transmission medium, usually measured in hertz (Hz) which equals cycles per second.

Bit - A contraction of the words binary digit. A bit is the smallest unit of information, representing either a mark or a space [one or zero]. In data transmission, the common unit of speed is bits per second(bps).

bps - Bits per second. Often preceded by K (kilo/thousands) or M (mega/million).

Braid - A weave of metal fibers used as a shield covering for an insulated conductor or group of insulated conductors. When flattened it may be used as a grounding strap.

Buffer - The material that surrounds the fiber cladding.

Bus - A collection of wires in a cable (or copper traces on a circuit board) used to transmit data, status and control signals. ISA, EISA, VL-Bus, and PCI are examples of PC buses. SCSI is also a bus. Also a Local Area Network topology in which all workstations are connected to a single cable. On a bus network, all workstations hear all transmissions on the cable. Each workstation then selects those transmissions addressed to it based upon address information contained in the transmission.

Cable - Either a standard conductor, with or without insulation and other coverings, or a combination of conductors insulated from each other.

Capacitance - The property of an electrical conductor (dielectric in a capacitor) that permits the storage of energy as a result of electrical displacement. The basic unit of capacitance is the farad, however, measurement is more commonly in microfarads or picofarads.

Capacitance, Mutual - The capacitance between two conductors with all other conductors, including shield, short circuited to ground.

Capacitance, Unbalance - An inequality of capacitance between the wires of two or more pairs which result in a transfer of unwanted signal from one pair to others.

Capacitance, Unbalance To Ground - An inequality of capacitance between the ground capacitance of the conductors of a pair which results in a pickup of external source energy, usually from power transmission lines.

CDDI - Copper Distributed Data Interface. Another name for ANSI X3T9.5 Committee's proposed 100 Mbps over UTP standard, TP-PMD (Twisted Pair Physical Media Dependent). CDDI is a trademark of Crescendo Communications/CISCO.

Characteristic Impedance - The ratio of voltage to current at any point along a transmission line on which there are no standing waves.

Circular Mil Area (CMA) - A unit of area equal to the area of a circle whose diameter is 1 mil (0.001 inch). Used chiefly in specifying cross-sectional areas of conductors.

Cladding -The transparent material, usually glass, that surrounds the core of the optical fiber. Cladding glass has a lower refractive index than core glass.

Cladding (Metal) - A method of applying a layer of metal over another metal whereby the junction of the two metals is continuously welded.

Coaxial Cable - A transmission line consisting of two conductors concentric with and insulated from each other. In its flexible form it consists of either a solid or stranded center conductor surrounded by a dielectric. A braid is then woven over the dielectric to form an outer conductor. A weatherproof plastic covering, usually vinyl, is placed on top of the braid.

Cold Flow - Permanent deformation of the insulation due to mechanical force or pressure (not due to heat softening).

Compound - An insulating or jacketing material made by mixing two or more ingredients.

Conductance - The ability of a conductor to carry an electric charge. The ratio of the current flow to the potential difference causing the flow. The reciprocal of resistance.

Connector - A coupling device employed to connect conductors to one circuit with those of another circuit. Used to provide rapid connect/disconnect mating with pc boards, posts or another connector.

Copolymer - A compound resulting from the polymerization of two different monomers.

Copper Clad - Steel with a coating copper welded to it, as distinguished from copper plated.

Cord - A small, flexible insulated cable.

Cord, Tinsel - The type of flexible electrical cord used for switchboard and other telephone cords. The conductors consist of thin narrow copper tapes wrapped spirally around textile cords.

Core -The center of an optical fiber. The core of communications grade fiber is made of glass that has a higher refractive index than the surrounding cladding glass.

Corona - A discharge of electricity appearing as a bluish-purple glow on the surface of, and adjacent to, a conductor when the voltage gradient exceeds a certain critical value. It is caused by the ionization of surrounding air by high voltage.

Glossary

Corona Resistance - The time that the insulation will withstand a specific level of field-intensified ionization that does not result in the immediate complete break-down of the insulation.

Cross connect - The physical connection between patch panels or punch down blocks that facilitates connection from the workstation to the host or network.

Cross-Linked - Inter-molecular bonds between long chain thermoplastic polymers by chemical or electron bombardment means. The properties of the resulting thermosetting material are usually improved.

Crosstalk - The unwanted introduction of signals from one channel to another.

Crosstalk, Far-end - Crosstalk measured by applying the disturbing signal on one pair at the near end and measuring the pick up on the disturbed pair at the far-end.

Crosstalk, Near-end - Crosstalk measured by applying and measuring the disturbing signal on two pairs at the same end.

C.S.A - Abbreviation for Canadian Standards Association, a non-profit, independent organization which operates a listing service for electrical and electronic materials and equipment. The Canadian counterpart of the Underwriters Laboratories.

Current Carrying Capacity - The maximum current an insulated conductor can safely carry without exceeding its insulation and jacket temperature limitations.

Current Rating - The maximum continuous electrical flow of current recommended for a given situation. It is expressed in amperes.

Cut-Through Resistance - The ability of a material to withstand mechanical pressure, usually a sharp edge or small radius, without separation.

Cycle - One complete sequence of values of an alternating quantity, including a rise to maximum in one direction and return to zero; a rise to maximum in the opposite direction and return to zero. The number of cycles occurring in one second is called the frequency.

Data Transfer Rate - Generally associated with high speed serial data transfer systems and measured in gigabits per second (Gbit/sec).

dB - Abbreviation-see decibel.

Decibel - A unit expressing the ratio of two voltages, currents or powers. It is equal to 20 times the common logarithm of the ratio of two voltages across or two currents through equal loads, or 10 times the common logarithm of the two powers. Once decibel is approximately the smallest change in audible power that can be recognized by the human ear.

Dielectric - A material that serves as an insulator. The amount of resistance to voltage in a given insulation.

Dielectric Constant (K) - The ratio of the capacitance using the material in question as the dielectric, to the capacitance resulting when the material is replaced by air. A low electric constant material results in low cable capacitance for a given size.

Dielectric Withstanding Voltage - The maximum potential gradient that a dielectric material can withstand without failure.

Differential - A SCSI bus configuration in which each signal is sent on two wires. The signal is derived by taking the difference in voltage between the two wires, effectively eliminating unwanted noise in the wire.

Discontinuity - Rated interconnection: a broken connection (open circuit) or the loss of a specified connection characteristic. Transient phenomena: Short term (temporary) interruption or unacceptable variation in current or voltage.

Dissipation - Unusable or lost energy, such as the production of unused heat in a circuit.

EIA 568A - Electronic Industries Association. A commercial building wiring standard for voice and data communications developed in 1989 by the EIA.

Electromagnetic Compatibility (EMC) - The ability of an electronic device to operate in its intended environment without its performance being affected by EMI and without generating EMI that will affect other equipment.

Electromagnetic Interference (EMI) - Unwanted electrical or electromagnetic energy that causes undesirable responses, degrading performance or complete malfunctions in electronic equipment. See also: noise.

Electromagnetic Propagation - Pertaining to the combined electric and magnetic fields associated with movements of electrons through conductors.

Electromotive Force (EMF) - See voltage.

EMI - Energy generated by outside sources, such as lighting systems and electric motors, which is received by copper data/voice cable and interferes with transmission.

Equalization - A process of compensating for increases in attenuation (signal loss) with frequency. Different frequencies are attenuated differently over a given distance.

Farad - Unit of capacitance whereby a charge of one coulomb produces a one volt potential difference.

FDDI - Fiber Distributed Data Interface. A standard for a 100 megabit-per-second local area network.

Fibre Channel - A scalable, high speed, serial data transfer interface standard (ANSI X3T11)

Flame Resistance - The ability of a material not to propagate flame once the heat source is removed.

Flex Life - The measurement of the ability of a conductor or cable to withstand repeated bending.

Frequency Modulation (FM) - A scheme for modulating a carrier frequency in which the amplitude remains constant but the carrier frequency is displaced in frequency proportionally to the amplitude of the modulating signal. An fm broadcast is practically immune to atmospheric and man-made interference.

GHz - See gigahertz

Giga - A prefix meaning one billion (10^9)

Gigabit Ethernet - High speed network data transfer protocol standard (IEEE 802.3z)

Gigahertz (GHz) - One billion cycles per second (10^9 cps)

Glossary

Graded-Index Fibre - An optical fibre in which the refractive index of the core materials varies across the core diameter, usually in a parabolic fashion, which the highest values at the core centre.

Ground - A connection, intentional or accidental, between an electrical circuit and the earth or some conducting body (e.g. chassis) serving in place of earth.

Heat-Shrinkable - A type of plastic material that has been cross-linked. A term describing tubes, sleeves, caps, boots, films or other forms of plastic which shrink to encapsulate, protect or insulate connections, splices, terminations and other configurations.

Henry - Unit of inductance such that the induced voltage in volts is numerically equal to the rate of change in current amperes per second.

Hertz (Hz) - International standard term for cycles per second. Named after the German physicist Heinrich R. Hertz (e.g. 60 cycles per second is equal to 60 hertz or 60Hz).

Hi-Pot - A test designed to determine the highest voltage that can be applied to a conductor without breaking through the insulation.

IDC - Insulation Displacement Contact. A type of wire terminating connection in which the insulating jacket is cut by the connector when the wire is inserted.

IEEE - Institute of Electrical and Electronic Engineers. An international professional society that issues its own standard, and is a member of ANSI and ISO.

IEEE 802.3 - is a physical layer standard for 10 Base T, 100 Base T, Ethernet and 1000 Base CX (Gigabit Ethernet).

IEEE 802.5 - is a physical layer standard for Token Ring.

Impedance (Z) - A measure of materials' resistance to the transfer of electricity.

Impedance Match - A condition in which the impedance of a component or circuit is equal to the internal impedance of the source, or the surge impedance of a transmission line. This gives maximum transfer of energy from the source to the load, as well as minimum reflection and distortion.

Inductance - One cause of reactance. An electromagnetic phenomenon in which the expanding and collapsing of a magnetic field surrounding a conductor or device tends to impede changes in current. The effects of inductance become greater as frequencies increase. The basic unit for inductance is the henry.

Inductive Coupling - Crosstalk resulting from the action of the electromagnetic field of one conductor on the other.

Input Impedance - The impedance that exists between the input terminals of an amplifier or transmission line when the source is disconnected. The circuit, signal level and frequency must be specified.

Insertion Loss - The loss in load power due to the insertion of a component, connector or device at some point in a transmission system. Generally expressed in decibels as the ratio of the power received at the load before insertion of the apparatus, to the power received at the load after insertion.

Insulation Resistance - The electrical resistance between two conductors separated by an insulating material.

Interference - An electrical or electromagnetic disturbance that causes undesirable response in electronic equipment.

ISDN - Integrated Services Digital Networking. A CCIT defined standard for a public-switched service that allows the digital transmission of voice, data, and video over one network. Being touted as "the next big thing" in voice, data and video integration.

Irradiation - In insulations the exposure of the material to high energy emissions for the purpose of favorably altering the molecular structure by crosslinking.

Jacket - The outside covering of a cable.

LAN - Local Area Network. A data communications network spanning a limited area. It provides communications between three or more computers and peripherals, in most cases using a high speed media as it's backbone.

Line Impedance - Impedance as measured across the terminals of a transmission line; frequently the characteristic impedance of the line.

LVDS - Low Voltage Differential Signals which reduce on-chip power consumption.

Matched Impedance - The coupling of two circuits in such a way that the impedance of one circuit equals the impedance of the other.

Mbps - Megabits per second.

Mega (M) - A prefix meaning one million (10^6).

Microwave - That portion of the electromagnetic spectrum lying between the far infrared and conventional radio frequency range. The microwave frequency range extends from 1 GHz to 300 GHz. Microwaves are usually used in point-to-point communications because they are easily concentrated into a beam.

Military Specification - Military requirements. The demand imposed upon a system to meet a military operational need.

Mismatch - The condition in which the impedance of a source does not match or equal the impedance of the connected load. This reduces power transfer by causing reflection.

Moisture Absorption - The amount of moisture, in percentage, that a material will absorb under specified conditions.

Multimode - A device that emits or a fiber that carried multiple modes of light.

Narrow Band - EMI generated from a device operating at a specific and limited range of frequencies. See also: electromagnetic interference (EMI)

Noise - An extraneous signal in an electrical circuit, capable of interfering with the desired signal. Classes of noise include burst of popcorn noise, intermediate frequency noise at a low audio frequencies, white (thermal) noise, etc. Signals from power supply or ground line coupled into an amplifier output may be considered noise.

Near End Crosstalk (NEXT) - Signal distortion as a result of signal coupling form one pair to another at various frequencies.

Glossary

Numerical Aperture (NA) - The characteristics of an optical conductor in terms of its acceptance of impinging light. Controlled by a specific code to cladding refractive indices.

Ohm - The unit of measurement for electrical resistance. A circuit is said to have a resistance of one ohm when applied emf of one volt causes a current of one ampere to flow.

Oxygen Index - Percentage of oxygen necessary to support combustion of a specified material.

P-cable - A 68 wire cable used for 16-bit SCSI-3 buses. P-cables can be used with Q-cables for 32-bit SCSI-3 buses.

Patch Cord - The connecting cord between the terminal device and the drop.

Percent Conductivity - Conductivity of a material expressed as a percentage of that of copper.

Permeability (chemical) - The passage or diffusion (or rate of passage) of a gas, vapor, liquid or solid through a barrier without physically or chemically affecting it.

Permeability (magnetic) - The measure of how much better a material is than air as a path for magnetic lines of force. Air is assumed to have a permeability of 1.

Propagation Delay - Time required for an electronic digital device, or transmission network to transfer information from its input to its output.

Propagation, Velocity of - The speed with which a signal wave travels through a particular transmission medium. It varies as follows:

Medium	Speed, miles per second
Light through space	186,284
Radio through air	142,000
Coaxial Cable	133,000

Propagation Delay Time - The time between the application of a digital input waveform and the corresponding change in input waveform. It is measured between reference points on the waveforms. The time is generally different for positive-going and negative-going waveforms.

Prototype - A model suitable for use in the complete evaluation of form, design and performance.

Pulse - A change in the level, over a relatively short period of time, of a signal whose value is normally constant.

Pulse Width - The length of time that the pulse voltage is at the transient level. Electronic pulse widths are usually in the millisecond (10^{-3}), microsecond (10^{-6}) or nanosecond (10^{-9}) range.

PVC - Polyvinyl Chloride. The material most commonly used for the insulation and jacketing of cable.

Q-cable - A 68-wire cable used in conjunction with a P-cable for 32 bit SCSI-3 buses.

Reflection Loss - The part of a signal which is lost due to reflection of power at a line of discontinuity.

Resonance - A frequency at which capacitive reactance and inductive reactance are equal and therefore cancel one another's effects.

RF - Abbreviation for radio frequency.

RG/U - Symbol used to designate coaxial cables that are made to Government Specification (e.g., RF-58U; in this designation the "R" means radio frequency, the "G" means Government, the "58" is the number assigned to the government approval, and the "U" means it is a universal specification).

Ribbon Cable - A flat cable of individually insulated conductors lying parallel and held together by means of adhesive or woven textile yarn.

Ring - A Local Area Network topology in which data is sent from workstations via a loop or ring. One conductor of a pair (vs. tip)

Rise Time - The time required for a component or logic circuit to change from the quiescent to the transient state when an input is applied. (i.e. elapsed time between application of input and attainment of full output level).

RMS - Abbreviation for root mean square.

Root Mean Square - The effective value of an alternating current, corresponding to the direct current value that will produce the same heating effect.

SCI - Scalable Coherent Interface is a point-to-point, unidirectional link for handling large amounts of data in scalable, massively parallel processors.

SCSI - Small Computer System Interface. An intelligent bus for transmitting data and commands between a variety of devices. There are many implementations of SCSI, including Fast SCSI, Wide SCSI, Fast Wide SCSI, Fast-20, and Fast-40.

SCSI-2 - The second generation for SCSI; Includes many improvements to SCSI-1, including Fast SCSI, Wide SCSI, and mandatory parity checking.

SCSI-3 - The third generation of SCSI; introduces Fast-20 and Fast-40 as improvements to the parallel bus. The standard also includes a number of specifications for high-speed serial bus architectures such as SSA, Fiber Channel, and IEEE1394.

SE - Single-Ended is a method of defining and/or measuring impedance.

Semi-Rigid - A cable containing a flexible inner core and relatively inflexible sheathing.

Sheath - The outer covering of a jacket over the insulated conductors to provide mechanical protections for the conductors. Also known as the external conduction surface of a shielded transmission line.

Shield/Shielding (Cable) - A conducting envelope, composed of metal strands, which enclose a wire, group of wires or cable so constructed that substantially every point on the surface of the underlying insulation is at ground potential or at some predetermined potential with respect to the ground.

Simplex - A transmission facility in which the transmission is restricted to only one direction at a time.

Shield/Shielding (Circuit) - The metal sleeving surrounding one or more of the conductors in a wire circuit to prevent interference, interaction or current leakage. Shielding protects a circuit against crosstalk.

Glossary

Shock (Mechanical) - (1) An abrupt impact applied to a stationary object. (2) An abrupt or nonperiodic change in position, characterized by suddenness, and by the development of substantial internal forces.

Sine Wave - A wave which can be expressed as the sine of linear function of time, space or both. A waveform, often viewed on an oscilloscope, of a pure alternating current or voltage.

Skew - A measurement of the difference in the electrical length of two conductors or pairs of conductors and generally measured in picoseconds.

Skin Effect - The tendency of alternating currents to flow near the surface of the conductor, thus being restricted to a small part of the total cross-sectional area. This effect increases the resistance and becomes more marked as the frequency rises.

SSA - Serial Storage Architecture is a serial data transfer standard (ANSI X3710.1)

Standing-Wave - Distribution of current and voltage on a transmission line, resulting from two sets of waves traveling in opposite directions.

Standing Wave Ratio - The ratio between maximum and minimum current or voltage along a line. It is a measure of the mismatch between the load and the line. It is equal to 1 when the line impedance is perfectly matched to the load. (In which case the maximum and minimum are the same, as current and voltage do not vary along the line). The perfect match would be a 1 to 1 ratio.

Super High Frequency (SHF) - The Federal Communications Commissions designation for the band from 3,000 to 30,000 MHz in the radio spectrum.

Sweep Test - A method to determine the frequency response of a cable by generating an RF voltage whose frequency is varied at a rapid constant rate over a given range.

10 Base-T - 10 Mbps 802.3/Ethernet over standard unshielded twisted pair cable specification. 10 Base-T supports network configurations using the CSMA/CD access method over a twisted pair transmission system up to 100 meters in length without the use of a repeater.

Temperature Rating - The maximum and minimum temperature at which an insulating material may be used in continuous operation without loss of its basic properties.

Tensile Strength - The greatest longitudinal stress that a substance or union can bear without tearing or pulling apart. In crimped terminations, it is the greatest longitudinal stress that a terminal can bear without the wire separating from the terminal.

Thermal Shock - The effect of heat or cold applied at such a rate that non-uniform thermal expansion or contractions occur within a given material or combination materials. The effect can cause inserts and other insulation materials to pull away from metal parts.

Thermoplastic - A material which softens when heated or reheated and becomes firm on cooling.

Thermoset - A material which hardens or sets when heat is applied, and which once set, cannot be resoftened by heating. The application of heat is called "curing."

Time-Delay - A Circuit that delays the transmission of an impulse for a definite and desired period of time.

Topology - The architecture of a network, or the way circuits are connected to link to the network nodes together.

Transceiver - A device used in contention networks for sending data over the network and receiving data from the network.

Trunk Cable - Trunk Cable typically refers to a copper twisted pair backbone or vertical riser cable consisting of multiple groups of 25 pairs.

Twisted pair - Two wires twisted together to reduce susceptibility to RF Noise.

Ultra-High Frequency (UHF) - A Federal Communications Commissions designation for the band from 300 to 3000 MHz on the radio spectrum. In television channels 14 to 83 or 470 to 890 MHz.

UTP - Unshielded Twisted Pair. Twisted pair cable without either individual or overall shielding.

Velocity of Propagation - The speed with which a signal wave travels through a particular transmission medium. It varies as follows:

Medium	Speed, miles per second
Light through space	186,284
Radio through air	142,000
Coaxial cable	133,000

Very High Frequency (VHF) - A Federal Communications Commissions designation for the band from 30 to 300 MHz on the radio spectrum.

VHDCI - Very High Density Cable Interconnect (0.8mm connector) for next generation Ultra-SCSI applications.

Voice frequency (VF) - Any frequency within that part of the radio frequency range essential to speech transmission of a commercial quality (i.e., 300-3400 Hz). Also referred to as telephone frequency.

Volt (V) - The unit of measurement for electromotive force (emf). It is equivalent to the force required to produce 1 ampere through a resistance of 1 ohm.

Voltage (E) - The term most often used to designate electrical pressure that exists between two points and is capable of producing a flow of current when a closed circuit is connected between the two points. Voltage is measured in volts, millivolts, microvolts and kilovolts. The terms electromotive force (emf), potential, potential difference and voltage drop are often referred to as voltage.

Voltage Drop - The voltage developed across a component or a conductor by the flow of current through the resistance or impedance of that component or conductor.

Voltage Rating - The highest voltage that may be continuously applied to a wire in conformance with standards or specifications.

VSWR - Abbreviation for voltage standing wave ratio. Also see: standing wave ratio.

Wavelengths - The distance an electromagnetic wave travels during the time it takes to oscillate through one complete cycle. The wavelengths of light used in fiber communications are usually measured in nanometers (nm). The common wavelengths or "windows" are 850nm, 1300nm, and 1550nm.

Z - Letter symbol used to represent impedance in ohms.

Notes



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