



## Belden Introduces New Low Loss 50 Ohm RF Transmission Cable

NP 157

*Belden's new*

*RF coaxial cables*

*provide the lowest*

*loss of any 50*

*Land Mobile Radio*

*transmission cables*

*currently available.*

**T**oday, wireless communication is a part of everyone's life.

From two-way radios to cellular phones to broadcasting television, people communicate more and more through a wireless network. Such networks are evolving on a daily basis and offering additional services that demand greater bandwidth and reliability.

All wireless systems use antennas, which are installed on different types of towers. Although these antennas are used for different applications, they have a similar medium for carrying signal and power: coaxial cable. Now Belden introduces its new 50 Ohm ( ) radio frequency (RF) coax cables engineered specifically for these demanding wireless environments.

### Applications

Wireless communications rely on coaxial cables to link tower-mounted antennas to base stations and transceiver equipment. Different coaxial cables are used, depending upon the application.

Belden's 50 RF series coaxial cables are the most reliable solutions available. They can be used in many areas of a wireless installation, including jumper assemblies, short antenna feeder runs, and any application that requires flexible and easy-to-route cables, such as interconnection and cross connection of base station equipment.

Best performance  
in its class

Belden's new 50 coaxial cables have been designed to meet and exceed the demanding transmission requirements of wireless networks.

Features include:

### Lowest Loss:

This new series of cables provides the lowest loss of any Land Mobile Radio type 50 coaxial cable in the market (from 5% to 10% lower depending upon the design and frequency.)

**Low VSWR:** All cables are 100% sweep tested to 6 GHz to allow for use in future high frequency applications.

### High Velocity of Propagation:

The foam high-density polyethylene insulation provides the highest velocity of any Land Mobile Radio type flexible coaxial product on the market. The high-density material properties provide superior crush resistance to minimize impedance variations and return loss, ensuring high performance both before and after installation (Part number 7805 utilizes a solid PE dielectric).

### Excellent Phase Stability:

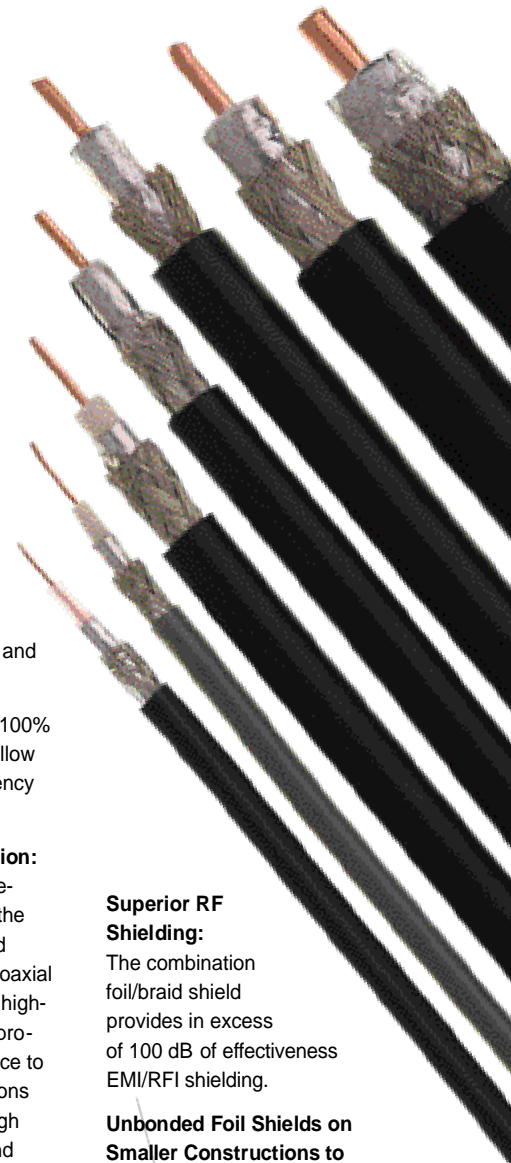
The new RF cables exhibit excellent phase stability over both temperature and flexing.

### Superior RF Shielding:

The combination foil/braid shield provides in excess of 100 dB of effectiveness EMI/RFI shielding.

### Unbonded Foil Shields on Smaller Constructions to Prevent Connector Shorting:

In the smaller designs — RF200 and under — the spacing between the foil shield and the center pin of the connector is extremely small.



...continued

During the cable stripping process, bonded foil shields tend to tear if not cleanly cut, leaving very small foil "stringers" that can short the shield to the center conductor. Un-bonded shields allow for the tape to be cut back from the dielectric thereby eliminating the potential shorting problem. The un-bonded shields are featured on RF100A, RF100LL, RF195, and RF200.

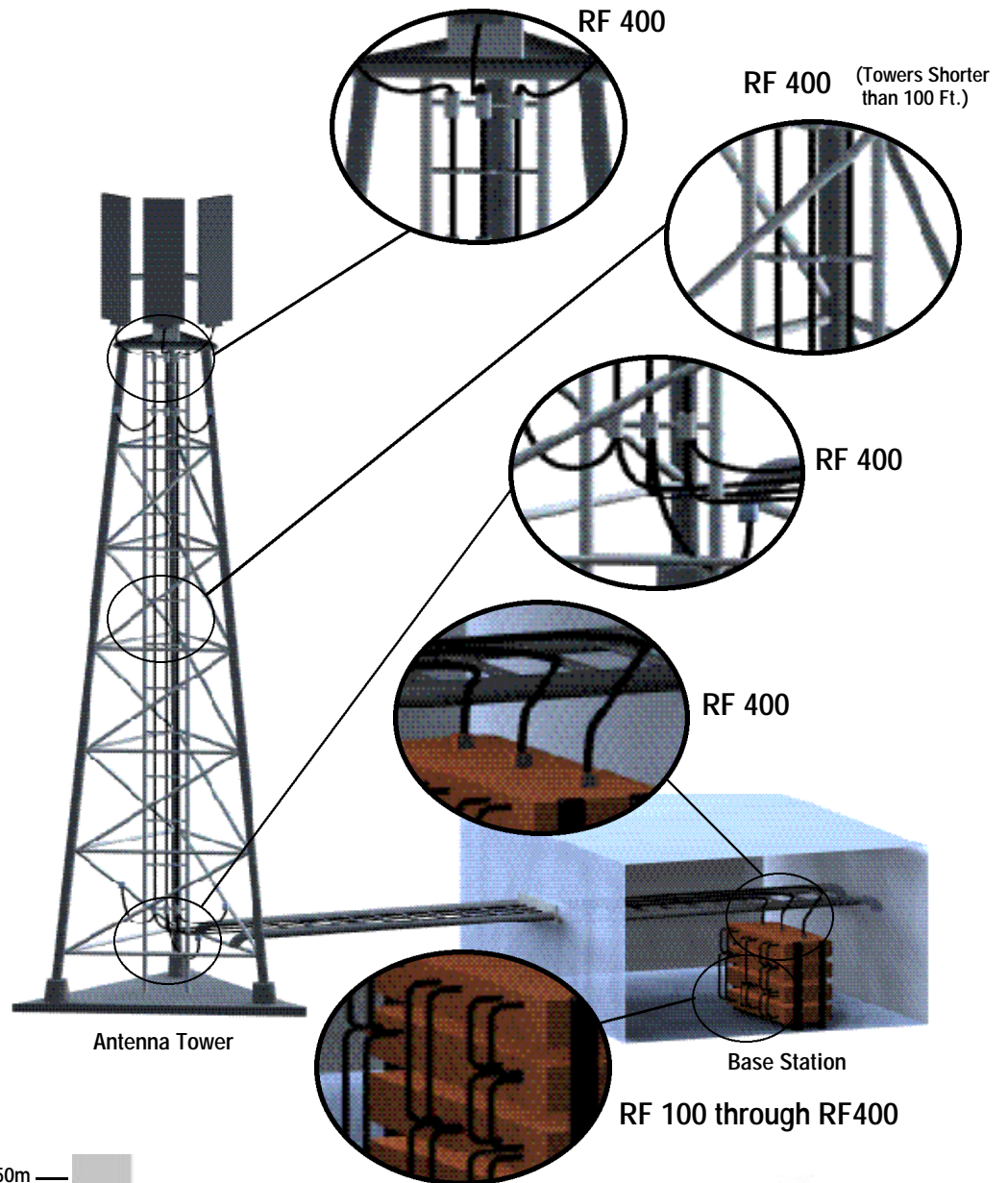
The larger constructions have sufficient spacing between the shield and center pin, and therefore feature the bonded foil shields.

**All-New Design:**

Belden's RF100LL is the only design of its kind. It features a slightly larger center conductor and a foam polyethylene insulation. These two features combined produce an attenuation that is approximately 7% lower than the standard solid polyethylene RF100 design.

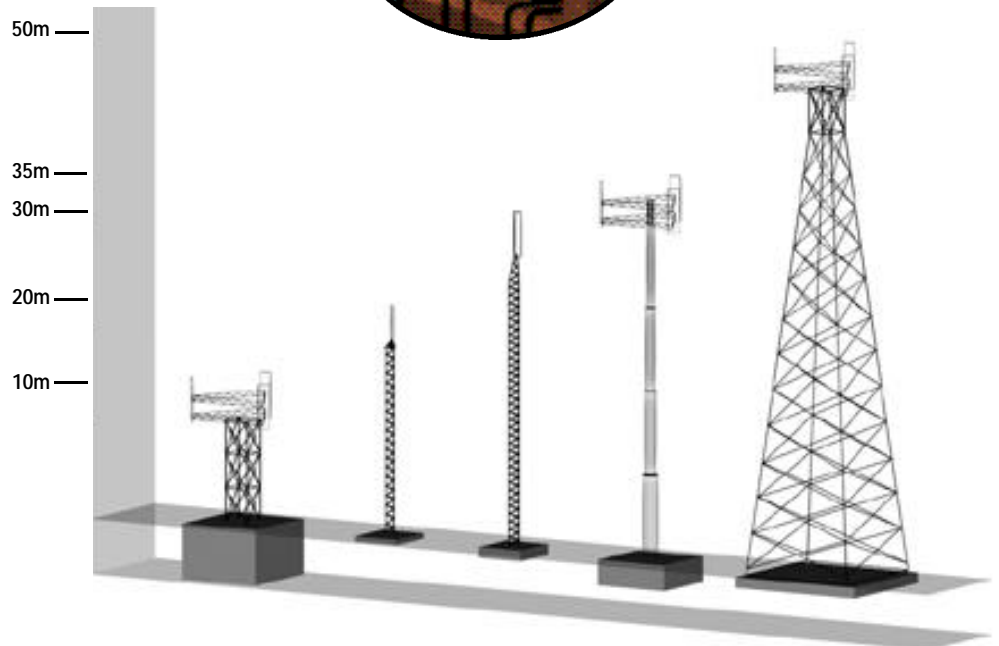
**Connector Compatibility:**

The RF series cables are compatible with all standard Land Mobile Radio type connectors, including Times Microwave, RF Industries, Amphenol, Trompeter, and EF Johnson. Please consult Belden's website, [www.belden.com](http://www.belden.com), for a complete listing.



**Product Availability**

The new RF cables are available with weather resistant polyethylene jackets and in a PVC-jacketed NEC CMR riser rated version in reels of 500 and 1,000 ft.. Flooded versions are also available upon special order. Contact Belden Electronics Customer Service department at 1-800-Belden-1 and request a quote through a Belden Distributor.



Description UL AWM Style	Trade No. UL NEC Type CSA Cert.	Standard Lengths		Std. Unit Lbs. ea.	AWG (stranding) [Dia. in In.] Nom. D.C.R.	Insulation & Nominal Core O.D.		Nominal O.D.		No. of Shields & Material Nom. D.C.R.	Nom Imp. (ohms)	Nom. Vel. of Prop.	Nominal Capacitance		Nominal Attenuation		
		ft.	m			Inch	mm	Inch	mm				pF/ft.	pF/m	MHz	db/ 100 ft.	db 100 m

**RG-174 Type**

<p><b>RF100A</b> 80° C</p> <p>Mates with standard RG-174 connectors</p>	<b>7805</b>	100 500 1000	30 152 305	6.0 8.7 13.0	25 (solid) .018 bare copper  32.0 /M 105.0 /km	.061	1.55	.110	2.79	Duofoil® + 90% tinned copper braid  9.1 /M 29.9 /km	50	66%	31.2	102.4	30	3.8	12.4
						Solid Polyethylene							PVC jacketed 100% sweep tested		50	4.9	16.1
<p><b>RF100LL</b> 80° C</p> <p>Mates with standard RG-174 connectors</p>	<b>7805R</b>  <b>NEC CMR</b> <b>CEC CMG</b>	100 500 1000	30 152 305	2.8 6.5 11.0	24.5 (solid) 0.0195 bare copper  27.3 /M 94.2 /km	.060	1.52	.110	2.79	Duofoil + 90% tinned copper braid  9.4 /M 30.8 /km	50	73.5%	26.2	86.0	30	3.5	11.5
						Foamed HDPE							PVC jacketed 100% sweep tested  Low loss version of RF100A		50	4.6	15.0

Wire illustrations shown at 200% of actual size.

**RG-58 Type**

<p><b>RF195</b> 80° C</p> <p>Mates with standard RG-58 connectors*</p>	<b>7806A</b>	500 1000	152 305	4.0 25.0	19 (solid) .037 bare copper  7.6 /M 24.9 /km	.110	2.79	.195	4.95	Duofoil® + 90% tinned copper braid  4.2 /M 13.8 /km	50	77%	24.3	79.7	30	2.0	6.6
						Gas Injected Foamed HDPE							PE jacketed 100% sweep tested		50	2.5	8.2
<p><b>RF200</b> 80° C</p> <p>Mates with standard Land Mobile Radio type connectors*</p>	<b>7806R</b>  <b>NEC CMR</b> <b>CEC CMG</b>	500 1000	152 305	16.0 29.0	19 (solid) .037 bare copper  7.6 /M 24.9 /km	.110	2.79	.195	4.95	Duofoil + 90% tinned copper braid  4.2 /M 13.8 /km	50	77%	24.3	79.7	150	4.0	13.3
						Gas Injected Foamed HDPE							PVC jacketed 100% sweep tested		50	4.9	16.1
<p><b>RF200</b> 80° C</p> <p>Mates with standard Land Mobile Radio type connectors*</p>	<b>7807A</b>	500 1000	152 305	16.0 29.0	17 (solid) .044 bare copper  3.3 /M 10.9 /km	.116	2.95	.195	4.95	Duofoil + 95% tinned copper braid  4.2 /M 13.8 /km	50	85%	23.5	77.1	30	1.6	5.4
						Gas Injected Foamed HDPE							PE jacketed 100% sweep tested		50	2.1	7.0
<p><b>RF200</b> 80° C</p> <p>Mates with standard Land Mobile Radio type connectors*</p>	<b>7807R</b>  <b>NEC CMR</b> <b>CEC CMG</b>	500 1000	152 305	16.5 31.0	17 (solid) .044 bare copper  3.3 /M 10.9 /km	.116	2.95	.195	4.95	Duofoil + 95% tinned copper braid  4.2 /M 13.8 /km	50	85%	23.5	77.1	150	12.0	39.2
						Gas Injected Foamed HDPE							PVC jacketed 100% sweep tested		50	12.0	39.2

\* Please consult Beldens website, [www.belden.com](http://www.belden.com), for complete listing.  
Wire illustrations shown at actual size.

Description UL AWM Style	Trade No. UL NEC Type CSA Cert.	Standard Lengths		Std. Unit Lbs. ea.	AWG (stranding) [Dia. in In.] Nom. D.C.R.	Insulation & Nominal Core O.D.		Nominal O.D.		No. of Shields & Material Nom. D.C.R.	Nom Imp. (ohms)	Nom. Vel. of Prop.	Nominal Capacitance		Nominal Attenuation		
		ft.	m			Inch	mm	Inch	mm				pF/ft.	pF/m	MHz	db/ 100 ft.	db 100 m

## RG-8X Type

<p><b>RF240</b> 80° C</p> <p>Mates with standard RG-8X connectors*</p>	<b>7808A</b>	500 1000	152 305	20.0 39.0	15 (solid) .057 bare copper	.150	3.81	.240	6.10	Duobond II+ 95% tinned copper braid	50	86%	23.0	75.5	30	1.3	4.1
						Gas Injected Foamed HDPE									3.5 /M	11.5 /km	PE jacketed 100% sweep tested
	<b>7808R</b> <b>NEC CMR</b> <b>CEC CMG</b>	500 1000	152 305	22.0 43.0	15 (solid) .057 bare copper	.150	3.81	.240	6.10	Duobond II+ 95% tinned copper braid	50	86%	23.0	75.5	150	2.8	9.3
						Gas Injected Foamed HDPE									3.2 /M	10.5 /km	PVC jacketed 100% sweep tested
															450	4.9	16.1
															900	7.0	22.9
															1500	9.1	30.0
															1800	10.1	33.2
															2000	10.7	35.0
															2500	12.0	39.5
															3000	13.4	43.9
															4500	16.7	54.7
															6000	19.8	65.0

Wire illustrations shown at actual size.

## Intermediate Type

<p><b>RF300</b> 80° C</p> <p>Mates with Land Mobile Radio type connectors*</p>	<b>7809A</b>	500 1000	152 305	22.5 49.0	13 (solid) .072 bare copper	.190	4.83	.300	7.62	Duobond II+ 95% tinned copper braid	50	86%	23.0	75.5	30	1.0	3.4
						Gas Injected Foamed HDPE									2.7 /M	8.8 /km	PE jacketed 100% sweep tested
	<b>7809R</b> <b>NEC CMR</b> <b>CEC CMG</b>	500 1000	152 305	34.0 65.0	13 (solid) .072 bare copper	.190	4.83	.300	7.62	Duobond II+ 95% tinned copper braid	50	86%	23.0	75.5	150	2.2	7.3
						Gas Injected Foamed HDPE									2.0 /M	6.6 /km	PVC jacketed 100% sweep tested
															450	3.9	12.9
															900	5.6	18.3
															1500	7.3	24.0
															1800	8.1	26.5
															2000	8.6	28.2
															2500	9.7	31.9
															3000	10.8	35.4
															4500	13.5	44.4
															6000	16.0	52.6

Wire illustrations shown at actual size.

## RG-8 Type

<p><b>RF400</b> 80° C</p> <p>Mates with 9913 and Land Mobile Radio type connectors*</p>	<b>7810A</b>	500 1000	152 305	52.2 106.0	10 (solid) .108 bare CCA	.285	7.24	.405	10.29	Duobond II+ 95% tinned copper braid	50	86%	23.0	75.5	30	.7	2.1
						Gas Injected Foamed HDPE									1.8 /M	5.8 /km	PE jacketed 100% sweep tested
	<b>7810R</b> <b>NEC CMR</b> <b>CEC CMG</b>	500 1000	152 305	57.5 116.0	10 (solid) .108 bare CCA	.285	7.24	.405	10.29	Duobond II+ 95% tinned copper braid	50	86%	23.0	75.5	150	1.5	4.9
						Gas Injected Foamed HDPE									1.3 /M	4.4 /km	PVC jacketed 100% sweep tested
															450	2.7	8.8
															900	3.8	12.6
															1500	5.1	16.6
															1800	5.6	18.5
															2000	6.0	19.6
															2500	6.7	22.0
															3000	7.5	24.4
															4500	9.5	31.1
															6000	11.4	37.3

\* Please consult Beldens website, [www.belden.com](http://www.belden.com), for complete listing.

Wire illustrations shown at actual size.



## RF Cables Cross Reference Guide

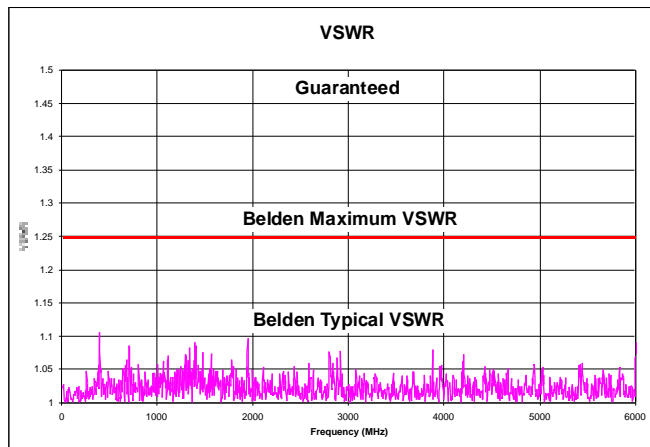
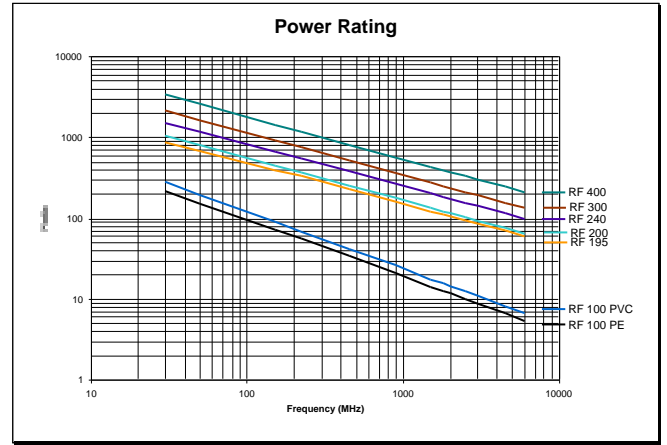
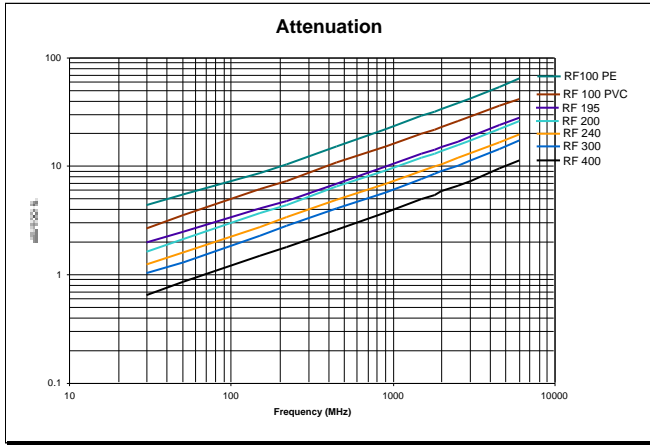
RG Type	Cable Type	Belden	Amphenol	Commscope	Harbour Industries	Times Microwave
RG-174	RF 100A	7805			HPP100	LMR-100A
	RF 100LL	7805R			*	*
RG-58	RF 195	7806A		WBC-195	HPF195	LMR-195
	RF 195	7806R		WBC-195R	*	*
	RF 200	7807A		WBC-200	HPF200	LMR-200
	RF 200	7807R		WBC-200R	*	*
RG 8x	RF 240	7808A	TWB 2401	WBC-240	HPF240	LMR-240
	RF 240	7808R	TWB 2401-FR	WBC-240R	*	*
Intermediate	RF 300	7809A		WBC-300	HPF300	LMR-300
	RF 300	7809R		WBC-300R	*	*
RG 8	RF 400	7810A	TWB 4001	WBC-400	HPF400	LMR-400
	RF 400	7810R	TWB 4001-FR	WBC-400R	*	*

\* Special Construction

## RG Cable Replacement Guide

Part Number	Size	Replacing
7805	RF100A	RG-174/U
7805R	RF100LL	RG-174/U
7806A	RF195	RG-58/U
7807A	RF200	RG-58/U
7808A	RF240	RG-8X
7809A	RF300	RG-8X
7810A	RF400	RG-8U

# Electrical Characteristics



## Phase Stability

Phase Attribute	Typical range (0.45-6.0 GHz)	
	ppm/ °C	degree/GHz/m
Temperature (-40 to + 85C) <sup>1</sup>	±9	±0.6
Bending & Flexing (25 cycles) <sup>2</sup>	NA	±1.1

1: Per IEC 60966-1 clause 8.8

2: Per IEC 60966-1 clause 8.6

*Voltage Standing Wave Ratio is a measurement of the reflected power in a cable or instrument. The higher the VSWR the poorer the transmission characteristics of the cable.*

### For More Information:

Belden Electronics Division  
 Technical Support  
 1-800-Belden1 or  
 1-800-Belden3  
[www.belden.com](http://www.belden.com)