

# PRECISION/REFERENCE AIR LINES

## General

Precision or reference air lines are air-dielectric transmission lines with highly accurate dimensions that can be used in measurement and calibration applications as fundamental impedance standards and to establish reference positions for measurements.

Maury offers bead supported and beadless connectors in air lines using 3.5mm, 7mm, 14mm and type N connectors. Beadless lines offer better impedance and electrical length accuracies and lower VSWR, while beaded lines offer greater convenience.

## REFERENCE AIR LINES – 14mm CONNECTORS

### Description

The 2453 series are beadless, virtually reflectionless, coaxial 14mm reference air lines with spring-loaded tips on the ends of the inner conductor to mate with 14mm connectors [1](#). VSWR is <1.006 at 8.5 GHz. The lines are fabricated from beryllium copper and are gold-plated to prevent tarnishing.

### Specifications

Frequency Range .....	DC to 8.5 GHz
VSWR .....	<1.001 + 0.0005f (GHz)
Characteristic Impedance .....	50 ± 0.05 ohms where skin depth is negligible
Electrical Length .....	See chart
Accuracy of Electrical Length .....	±0.005cm
Connector .....	LPC14 <a href="#">2</a>



Model	Electrical Length (cm)	Odd 1/4-Wavelength Frequency (GHz) <a href="#">3</a>
2453A	29.979	(2n + 1) 0.25
2453B	19.986	(2n + 1) 0.375
2453C	14.990	(2n + 1) 0.50
2453D	9.993	(2n + 1) 0.75
2453E	7.495	(2n + 1) 1.00
2453F	5.996	(2n + 1) 1.25
2453G	4.997	(2n + 1) 1.50
2453H	2.998	(2n + 1) 2.50

## PRECISION AIR LINES – 14mm CONNECTORS

### Description

The 2403 series are precision 14mm reference air lines fabricated from beryllium copper with gold plating to prevent tarnishing. Center conductor support is provided by a low loss bead structure which results in a VSWR <1.02 at 8.5 GHz.

### Specifications

Frequency Range .....	DC to 8.5 GHz
VSWR .....	1.02 maximum
Characteristic Impedance .....	50 ± 0.06 ohms
Electrical Length .....	See chart
Accuracy of Electrical Length .....	±0.02cm
Connector .....	LPC14 <a href="#">4</a>

Model	Electrical Length (cm)	Odd 1/4-Wavelength Frequency (GHz) <a href="#">3</a>
2403A	29.979	(2n + 1) 0.25
2403B	19.986	(2n + 1) 0.375
2403C	14.990	(2n + 1) 0.50
2403D	9.993	(2n + 1) 0.75
2403E	7.495	(2n + 1) 1.00
2403F	5.996	(2n + 1) 1.25
2403G	4.997	(2n + 1) 1.50

### 14mm Reference Air Line Kits

The 2453K consists of one (each) of 2453C, D, E, F, G and H. The 2403K consists of one (each) 2403A, C, D, E, and G to which the 2403L adds one (each) 2403B and F. All kits are provided in foam-lined wooden instrument cases.

[1](#) Precision 14mm connector that is mating compatible with GR900.

[2](#) A beadless 14mm connector that mates with GR900 connectors.

[3](#) Frequencies at which the electrical length is an odd multiple of a 1/4 wavelength where n is zero or an integer.

[4](#) A beaded 14mm connector that mates with GR900 connectors.

