



## Series 7334

# AC/DC Resistance Standards

Very High Stability Calibration Laboratory Standards



## 7334 Features

- > AC/DC error < 0.8 ppm at 1kHz
- > Stability < 0.5 ppm/year
- > Temperature coefficient < 0.2 ppm/°C, oil or air Baths not required
- > Resistance Range 1 Ω to 10k Ω
- > Either Binding Posts or BPO style connectors are available
- > Nominal Accuracy < 2 ppm
- > Voltage Hysteresis < 0.1 ppm
- > Compact and ruggedized
- > Report of Calibration traceable to NIST, NPL UK or INMS/NRCC included
- > Guard and Shield compliant
- > Operating Range 18 °C to 28 °C
- > Special values available on request

**G**uildline 7334 series Resistance Standards are designed as very high stability calibration laboratory standards for high accuracy resistance calibration in air, without the need for stabilization in a temperature controlled bath. These standards are suitable for both AC and DC applications.

They can be used as working standards or highly reliable and rugged transportable transfer standards. They are extremely useful for the calibration of resistance ranges of multi-function calibrators and high accuracy DVMs, as well as being used in more classical standards and calibration in resistance and temperature measurements.

Hysteresis error, is typically better than negligible to 0.1 ppm when stressed at three times the maximum voltage, and less than 0.3 ppm over a temperature cycle between 0 °C and 40 °C.

Connections to these resistance standards are made via the gold plated 5-way binding posts. In DC measurement, these gold plated binding posts yield the lowest thermal EMF when connected with gold, copper or silver. British Post Office (BPO) style connectors and BNC

***The 7334 Series Precision Resistance Standards are true AC/DC standards with minimal AC/DC error up to 1 kHz, and are available in a wide range of off the shelf***

The impedance of the resistor is expressed as:

$$Z(f) = R(f) \cdot (1 + j2\pi f\tau)$$

Where  $R(f)$  is the real part of the impedance,  $f$  is the frequency in Hz and  $\tau$  is the time constant of the standard. Parameter  $R(0)$  is the resistance measured with DC energisation. The 7334 standards have very flat frequency response. The resistive component is virtually independent of frequency, with far less than 0.8 ppm of AC/DC difference between DC and 1000Hz. The 7334 series of standards are almost purely resistive with very small time constant. For a 7334-100Ω, the time constant is typically less than 10ns.

The AC/DC difference is so insignificant that it is almost negligible, when compared to measurement noise. A user can confidently use the Guildline model 7334 for DC resistance calibration, as a reference with an AC temperature bridge, as an AC impedance standard, or elsewhere in AC/DC metrology that calls for a stable, precision standard.

Special values such as 0.25Ω and 12.9064kΩ, are available for highly specialized applications.

# 7334 Resistance Standards

## 7334 Series Specifications

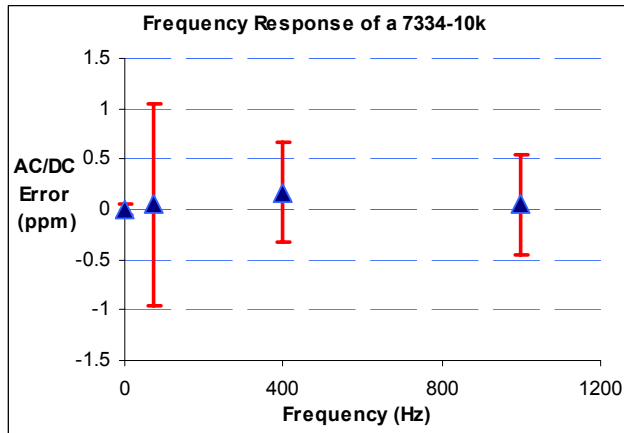
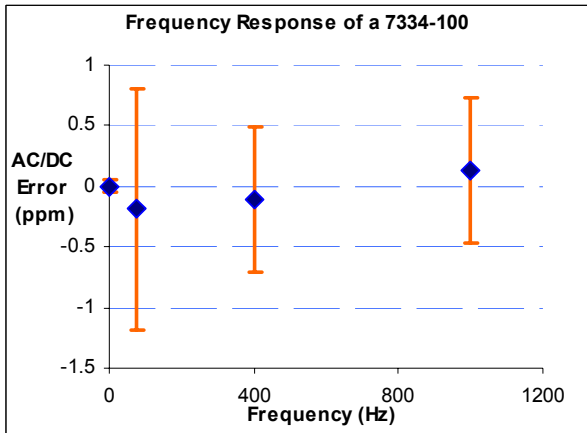
Model	Nominal Value (Ω)	Nominal Initial Tolerance (± ppm) (Note 1)	Calibration Uncertainty (± ppm) (Note 2)	Stability 12 Months (ppm)	Temperature Coefficient (±ppm/°C)	Max. Excitation (mA)	AC/DC difference at 1kHz (ppm)
7334-1	1	2	1	2.5	1	316	< 3
7334-2.5	2.5	2	1	2.5	1	200	<3
7334-10	10	2	1	2.5	0.2	100	<0.8
7334-25	25	2	1	2.5	0.2	64	<0.8
7334-100	100	2	1	2.5	0.2	32	<0.8
7334-1k	1k	2	1	2.5	0.2	10	<0.8
7334-10k	10k	2	1	2	0.2	3.2	<0.8

Special values available on request.

**Note 1:** Nominal initial tolerance is defined as the maximum variation of resistance mean values as initially adjusted at the point of sale.

**Note 2:** Calibrated under DC excitation, in air at 21, 23 and 25 °C referred to the unit of resistance as maintained by the National Research Council of Canada (NRC), National Physical Laboratory (NPL UK) or the National Institute of Standards and Technology (NIST), and expressed as a total uncertainty with a coverage factor of k = 2. A traceable report of calibration stating the measured values and uncertainty is provided with each resistor.

**Note 3:** Voltage hysteresis: negligible to < 0.1 ppm  
Temperature hysteresis: < 0.3 ppm between 0 °C and 40 °C



AC/DC error of a 7334-100Ω and a 7334-10kΩ, calibrated by National Physical Laboratory (NPL) of UK

## Ordering Information

7334-value Resistance Standard, with binding posts  
 7334/BPO -value Resistance Standard, with BPO connectors  
 7334/BNC -value Resistance Standard, with BNC connectors  
 Certificate of Calibration (included)  
 Report of Calibration (included)  
 TM 7334 Technical Manual (included)  
 6664A-12 Solid copper wire (SCW) lead pair with gold plated banana plugs, 2m in length

73340-1 Teflon insulated lead with 4 stranded silver coated copper conductors and guard, trimmed ends, 2m in length  
 73340-2 Teflon insulated lead with 4 stranded silver coated copper conductors and guard, trimmed ends, xm in length  
 73340-BPO Teflon insulated lead with 4 stranded silver coated BPO connectors and guard, trimmed ends, 2m in length  
 73340-BNC Teflon insulated lead with 4 stranded silver coated BNC connectors and guard, trimmed ends, 2m in length

## General Specifications

**Environment:** Operating 18 °C to 28 °C  
 < 70% RH, non-condensing  
 Storage -20 °C to 60 °C  
 < 90% RH, non-condensing

**Dimensions**  
 H 88 mm (3.5 in)  
 W 124 mm (4.9 in)  
 D 79 mm (3.1 in)

**Weight** 0.6 kg (1.4 lbs)

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