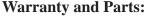
# 615-4500 (10-143) Resistance Coils

Coil Length		Wire Type	Resistance
40cm	(.012")	#30 NiCr	5.7-6.0
80cm	(.012")	#30 NiCr	11.3-11.6
120cm	(.012")	#30 NiCr	17.1-17.4
160cm	(.012")	#30 NiCr	22.7-23.0
200cm	(.012")	#30 NiCr	28.4-28.8
200cm	(.014")	#26 NiCr	12.9-13.2
1000cm (2)	(.012")	#30 Cu	3.1 -3.4

Note: these valus may vary by individual set and by the measuring tool.



We replace all defective parts free of charge. All products warranted to be free from defect for **90 days.** this warranty does not apply to accident, misuse, or normal wear and tear.

Table of Resistivity			
ohm-meters	x 10 <sup>-8</sup>		
Aluminum	2.83		
Carbon	3500		
Copper	1.72		
Iron	10		
Mercury	96		
Nichrome	100		
Manganin	44		
Platinum	10		
Silver	1.63		
Tungsten (20° C)	5.51		
Tungsten (3200° C)	118		

#### P/N 24-10143

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# **Description:**

Use this handy set to study how resistance is affected by **type**, **length** and **diameter** of wire you use. The set consists of 8 labeled coils, each with 2 terminals, which are easy to use because the math is simple. The set includes 30 gauge nichrome wire in the following lengths; 200 cm (2 coils), 160 cm, 120 cm, 80 cm, 40 cm; plus 26 gauge nichrome (20 cm) and 30 gauge copper (2000 cm).

The *Laws of Resistance for Wire* may be summarized as:

### $\mathbf{R} = \mathbf{k} \mathbf{L}/\mathbf{A}$

where  $\mathbf{R}$  is resistance in ohms;  $\mathbf{L}$  is the length;  $\mathbf{A}$  is the cross-sectional area, and  $\mathbf{K}$  is the resistivity of the material of which the wire is made. If  $\mathbf{L}$  is in meters and  $\mathbf{A}$  is in square meters, the unit of  $\mathbf{K}$  is the ohm-meter. The resistivity in ohm-meters is numerically equal to the resistance of a block of the material one square meter in cross-sectional area and one meter long.

#### **How to Teach with Resistance Coils**

**Concepts Taught:** Electrical voltage; current intensity; Ohm's Law; Resistance as function of conductor characteristics; type, length and diameter of conducting wire.

**Curriculum Fit:** Physics Sequence, *Electricity & Magnetism;* Unit, Electric Circuits. **Grades 11-12.** 



Resistance of 30 gauge nichrome wire is 14.37  $\Omega$  per meter. Resistance of 26 gauge nicrome wire is 6.48  $\Omega$  per meter. Resistance of 26 gauge nicrome wire is 6.48  $\Omega$  per meter.

## **Related Products:**

- 615-4540 Wheatstone Bridge:
  Classic way of measuring resistance in a conductor by comparing a wire with known resistance to one with unknown resistance.
  Traditional slide-wire construction with meter-long high resistance nichrome wire and double-ended sliding knife edge contact.
- 615-4590 Marsh Resistance Board:

  This brand new resistance wire set features eight (8) different gauge
  Nichrome wires of equal length.

  It is ideal for showing resistivity of different gauge wires. A convenient scale is silkscreened onto the mounting board for easy measurements of the length of wire.
- 615-4545 Unknown Resistance:
  Good for use with Wheatstone
  Bridge or as an exercise in measuring individual unknowns. Contains
  9 unique precision "unknown" 1%
  resistors ranging from 1 to 100
  kilohm with terminals, can connect in series if desired.