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.

Resistance of 30 gauge nichrome wire is 14.37 Ω per meter. Resistance of 26 gauge nicrome wire is 6.48 Ω per meter. Resistance of 26 gauge nicrome wire is 6.48 Ω per meter.

Warranty and Parts:

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^{-8}
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**

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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:

$$R = k\ L/A$$

where **R** is resistance in ohms; **L** is the length; **A** is the cross-sectional area, and **K** is the resistivity of the material of which the wire is made. If L is in meters and A is in square meters, the unit of 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.**

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.