

'Constantan' Resistance Wire Gauge Reference

Description

Gauges and Properties: Wire is measured in millimetres but it is common to specify the wire size in 'gauge'. Two different gauge systems are used here, the more common SWG (Standard Wire Gauge) and B&S (Brown & Sharp).

The following tables shows the diameter on both mm and gauges (both SWG and B&S) together with resistance per 100 metres length and length in metres on a 50g reel. These tables could be useful in the classroom to help teachers choose the correct gauges for certain experiments. There are many sizes available, but only the popular sizes used in the classroom are listed below, contact Wiltronics for more information about unlisted items.

CONSTANTAN: For example if a 10 ohm resistor is required for an experiment, it is usually most important that it remains 10 ohms when cold, warm or hot. In these cases, an alloy of 56% copper and 44 % nickel is used and it's resistance value is almost unchanged with temperature change. The colour is silver, it does not easily oxidise and it is easy to solder because the metals that make the alloy are both easy to solder. There are several trade names for this wire including: Advance, Eureka, Constantan, Ferry, Cuprothal and others. This wire can be run very hot but it will soften and melt at around a full red temperature.

Specifications

	Diameter (mm)	SWG	Nominal Ohms (per meter)	100g Reel (approx. meter)
CB3118-100	1.22	18	0.74	9
CB3120-100	0.91	20	1.2	16
CB3122-100	0.71	22	2	28
CB3124-100	0.57	24		45
CB3126-100	0.42	26	4.9	68
CB3128-100	0.36	28	6.9	100
CB3130-100	0.32	30	7.6	140
CB31-32-100	0.27	32	11.8	180

'CONSTANTAN' RESISTANCE WIRE. 56% copper, 44% nickel.

'Nichrome' Resistance Wire Gauge Reference

Description

NICHROME: When used for heating purposes and when the stability of the resistance value is not important, an alloy called 'Nichrome' is normally used. As its common name suggests, it is an alloy of 80% Nickel and 20% Chromium. It is not easy to solder and, in industry, a special flux of phosphoric acid needs to be used. Because solder will melt when heated, Nichrome is usually welded to other metal to make an electrical connection.

'Nichrome', when compared with 'Constantan', is harder to bend and is approximately double the resistance per metre. Nichrome can be run up to very high temperatures where the wire can become bright red in colour. The electrical resistance of the wire rises with the temperature and there are several different grades of 'Nichrome' for various applications. To make Nichrome wire insulating, it is heavily oxidised and made black by a special chemical process.

Specifications

	Diameter (mm)	SWG	Nominal Ohms (per meter)	100g Reel (approx. meter)
CB3318-100	1.21	18	1.18	4.7
CB3319-100	0.95	19	1.34	7
CB3320-100	0.85	20	1.62	8.5
CB3321-100	0.71	21	3.3	10
CB3322-100	0.65	22	5.8	12.1
CB3324-100	0.56	24	5.47	22.7
CB3326-100	0.43	26	8.2	34.0
CB3328-100	0.36	28	11.31	50.0
CB3330-100	0.30	30	17.2	71.0
CB3332-100	0.27	32	22.2	94.0

'NICHROME' RESISTANCE WIRE. 80% nickel, 20% chrome.

Specifications

	Diameter (mm)	SWG	Nominal Ohms (per meter)	100g Reel (approx. meter)
CB3218-100	1.21	18	14.85	4.7
CB3220-100	0.85	20	26.41	8.5
CB3222-100	0.71	21	43.65	14.1
CB3224-100	0.56	24	70.71	22.7
CB3226-100	0.43	26	105.60	34.0
CB3228-100	0.38	28	156.20	50.0

'COPPER' Resistance Wire