

Brand Name	SPECIAL NICKEL	
Material Code	2.4062	
Abbreviation	Ni 99.4 Fe	
Chemical Composition (mass components) in % Average values of alloy components		
Ni	Fe	
Rem.	0.4	

Form of Delivery

SPECIAL NICKEL is supplied in the form of round wires in the range 1.0 to 0.03 mm Ø in bare or enamelled condition, also with

rayon or silk covering, as well as in the form of stranded wires.

Properties and Application Notes

SPECIAL NICKEL is especially characterized by a high and exactly defined temperature coefficient, standardized in DIN 43760. This alloy is exclusively used for temperature sensors and resistance thermometers. The maximum working temperature in air is 700 °C, for resistance thermometers according to DIN 43760 it is 250 °C.

Electrical Resistance in Annealed Condition

Temperature coefficient of electrical resistance between 0° C and 100 °C 10 ⁻⁶ /K	Electrical resistivity in: µΩ x cm (first line) and Ω/CMF (second line) Reference Values						
	20 °C	0 °C	50 °C	100 °C	150 °C	200 °C	250 °C
+ 6100 to + 6260 ¹⁾	7.65 ²⁾	6.88	8.88	11.1	13.7	16.6	19.9
	46	41	53	67	82	100	120

Physical Characteristics (Reference Values)

Density at 20 °C		Melting Point °C	Specific heat at 20 °C J/g K	Thermal conductivity ³⁾ at 20 °C W/m K	Average linear thermal expansion coefficient between 20 °C and		Thermal EMF against copper at 20 °C µV/K
g/cm ³	lb/cubin				100 °C 10 ⁻⁶ /K	400 °C 10 ⁻⁶ /K	
8.9	0.32	1440	0.47	70	13	14	-23

Strength Properties at 20 °C in Annealed Condition

Tensile Strength ⁴⁾		Elongation (L ₀ = 100 mm) % at nominal diameter in mm				
MPa	psi	0.02 to 0.063	>0.063to0.125	> 0.125 to 0.5	> 0.5 to 1	> 1
450	65300	≈ 10	≈ 15	≈ 18	≥ 20	≥ 25

1) Standard nominal value = +6180 x 10⁻⁶/K.

2) Approximate value, not standardized.

3) As with all pure metals, the thermal conductivity strongly depends on the purity and temperature.

4) This value applies to wires of 2 mm diameter. For thinner wires the minimum values will substantially increase, depending on the dimensions.

Nominal Diameter d mm	Weight per 100 m g	DC Resistance Referred to Length at 20 °C Ω/m
0.03	0.629	108
0.04	1.12	60.9
0.05	1.75	39.0
0.06	2.52	27.1
0.07	3.42	19.9
0.08	4.47	15.2
0.09	5.66	12.0
0.10	6.99	9.74
0.12	10.1	6.76
0.14	13.7	4.97
0.15	15.7	4.33
0.16	17.9	3.80
0.18	22.6	3.01
0.20	28.0	2.43
0.30	62.9	1.08
0.40	112	0.609
0.50	175	0.390
0.60	252	0.271
0.70	342	0.199
0.80	447	0.152
0.90	566	0.120
1.00	699	0.0974

Notes on Treatment

SPECIAL NICKEL can be worked easily. This alloy can be soldered and brazed without difficulty. All known welding methods can be used.

The resistance values per meter of length quoted in the table are not standardized. The resistance values per meter of length shown on the labels of the reels apply to a temperature of 20 °C.

Basic values in Ω at different temperatures in $^{\circ}\text{C}$ for a measuring of nickel according to DIN 43760
(basic value 100 Ω at 0 $^{\circ}\text{C}$)

$^{\circ}\text{C}$	0	-1	-2	-3	-4	-5	-6	-7	-8	-9
-60	69.5	-	-	-	-	-	-	-	-	-
-50	74.3	73.8	73.3	72.8	72.3	71.9	71.4	70.9	70.5	70.0
-40	79.1	78.6	78.1	77.7	77.2	76.7	76.2	75.7	75.2	74.7
-30	84.1	83.6	83.1	82.6	82.1	81.6	81.1	80.6	80.1	79.6
-20	89.3	88.8	88.3	87.7	87.2	86.7	86.2	85.7	85.2	84.7
-10	94.6	94.0	93.5	93.0	92.5	91.9	91.4	90.9	90.3	89.8
0	100.0	99.5	98.9	98.4	97.8	97.3	96.7	96.2	95.7	95.1

$^{\circ}\text{C}$	0	1	2	3	4	5	6	7	8	9
0	100.0	100.5	101.1	101.7	102.2	102.8	103.3	103.9	104.4	105.0
10	105.6	106.1	106.7	107.2	107.8	108.4	108.9	109.5	110.1	110.7
20	111.2	111.8	112.4	113.0	113.5	114.1	114.7	115.3	115.9	116.5
30	117.1	117.7	118.2	118.8	119.4	120.0	120.6	121.2	121.8	122.4
40	123.0	123.6	124.2	124.8	125.4	126.0	126.7	127.3	127.9	128.5
50	129.1	129.7	130.3	131.0	131.6	132.2	132.8	133.5	134.1	134.7
60	135.3	136.0	136.6	137.2	137.9	138.5	139.2	139.8	140.4	141.1
70	141.7	142.4	143.0	143.7	144.3	145.0	145.6	146.3	146.9	147.6
80	148.9	148.9	149.6	150.2	150.9	151.6	152.2	152.9	153.6	154.3
90	154.9	155.6	156.3	157.0	157.7	158.3	159.0	159.7	160.4	161.1
100	161.8	162.5	163.2	163.9	164.6	165.3	166.0	166.7	167.4	168.1
110	168.8	169.5	170.2	170.9	171.6	172.4	173.1	173.8	174.5	175.2
120	176.0	176.7	177.4	178.2	178.9	179.6	180.4	181.1	181.8	182.6
130	183.3	184.1	184.4	185.6	186.3	187.1	187.8	188.6	189.4	190.1
140	190.9	191.7	192.4	193.2	194.0	194.7	195.5	196.3	197.1	197.9
150	198.6	199.4	200.2	201.0	201.8	202.6	203.4	204.2	205.0	205.8
160	206.6	207.4	208.2	209.0	209.8	210.6	211.5	212.3	213.1	213.9
170	214.8	215.6	216.4	217.3	218.1	218.9	219.8	220.6	221.5	222.3
180	223.2	224.0	224.9	225.7	226.6	227.4	228.3	229.2	230.0	230.9
190	231.8	232.7	233.5	234.4	235.3	236.2	237.1	238.0	238.9	239.8
200	240.7	241.6	242.5	243.4	244.3	245.2	246.1	247.0	247.9	248.9
210	249.8	250.7	251.7	252.6	253.5	254.5	255.4	256.3	257.3	258.2
220	259.2	260.2	261.1	262.1	263.0	264.0	265.0	266.0	266.9	267.9
230	268.9	269.9	270.9	271.8	272.8	273.8	274.8	275.8	276.8	277.9
240	278.9	279.9	280.9	281.9	282.9	284.0	285.0	286.0	287.1	288.1
250	289.2	-	-	-	-	-	-	-	-	-