
CN49 Copper Nickel Resistance Wire Type 49
電気抵抗用 CN49 (CuNi44)
(銅ニッケル抵抗線 49種)

電気抵抗用 銅ニッケル抵抗線 49種 (CuNi44)

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[JIS C 2532]

耐熱性耐酸化性があり、400℃まで使用できる。非磁性で常温での温度係数が小さい。
細線、圧延など加工性が良好であり、ろう接性ハンダ付け良好。
精密級交流抵抗器、通信機器用精密抵抗器などに使用される。

| JIS記号 | JISコード | 体積抵抗率 [$\mu\Omega\text{m}$] | 抵抗温度係数 [$\times 10^{-6}/^{\circ}\text{C}$] |
|-------|--------|----------------------------------|---|
| GCN49 | C 2532 | 0.49 \pm 0.03 | * \pm 40 |

注(*)参考値

| 対銅起電力 Mv/K (0~100℃) | 熱膨張係数 $\times 10^{-6}/$ | 比熱 J/g·K (20℃) | 熱伝導率 w/m·K | 密度 g/cm ³ (20℃) | 融点 ℃ | 最高使用温度 ℃ |
|---------------------------|----------------------------|----------------------|---------------|----------------------------------|---------|-------------|
| -41 | 13.5 | 0.41 | 23 | 8.90 | 1240 | 400 |

| 化学成分 | Mn | Ni | Cu+Ni+Mn |
|------|---------|-------|-----------|
| (%) | 0.5~2.5 | 42~48 | \geq 99 |

| 記号 | 種類 | 範囲 (mm) | |
|-------|-------|-------------------|---------------------|
| CN49W | 線 | ϕ 6.00~0.025 | |
| CN49R | 帯 | t=2.90~0.08 | w=40~0.4 (厚さにより異なる) |
| CN49P | 板 | お問い合わせ下さい | |
| CN49 | コイル・箔 | お問い合わせ下さい | |

CN49W【導体抵抗・長さ・重量】

丸線

体積抵抗率(23°CμΩm)0.49±0.03

| 線径 (mm) | 線径許容差 (mm) | 断面積 (mm ²) | 導体抵抗 許容差(%) | 導体抵抗 (Ω/m) | 長さ (m/Kg) | 重量 (g/m) |
|------------|---------------|---------------------------|----------------|---------------|--------------|-------------|
| 6.00 | ±0.080 | 28.27 | ±5 | 0.0173 | 3.97 | 252 |
| 5.50 | ±0.063 | 23.76 | ±5 | 0.0206 | 4.73 | 211 |
| 5.00 | ±0.063 | 19.64 | ±5 | 0.0250 | 5.72 | 175 |
| 4.50 | ±0.063 | 15.90 | ±5 | 0.0308 | 7.06 | 142 |
| 4.00 | ±0.063 | 12.57 | ±5 | 0.0390 | 8.94 | 112 |
| 3.50 | ±0.050 | 9.621 | ±5 | 0.0509 | 11.7 | 85.6 |
| 3.20 | ±0.050 | 8.042 | ±5 | 0.0609 | 14.0 | 71.6 |
| 2.90 | ±0.050 | 6.605 | ±5 | 0.0742 | 17.0 | 58.8 |
| 2.60 | ±0.040 | 5.309 | ±5 | 0.0923 | 21.2 | 47.3 |
| 2.30 | ±0.040 | 4.155 | ±5 | 0.118 | 27.0 | 37.0 |
| 2.00 | ±0.040 | 3.142 | ±5 | 0.156 | 35.8 | 28.0 |
| 1.80 | ±0.040 | 2.545 | ±5 | 0.193 | 44.2 | 22.6 |
| 1.60 | ±0.032 | 2.011 | ±5 | 0.244 | 55.9 | 17.9 |
| 1.50 | ±0.032 | 1.767 | ±5 | 0.277 | 63.6 | 15.7 |
| 1.40 | ±0.032 | 1.539 | ±5 | 0.318 | 73.0 | 13.7 |
| 1.30 | ±0.032 | 1.327 | ±5 | 0.369 | 84.7 | 11.8 |
| 1.20 | ±0.025 | 1.131 | ±5 | 0.433 | 99.3 | 10.1 |
| 1.10 | ±0.025 | 0.9503 | ±6 | 0.516 | 118 | 8.46 |
| 1.00 | ±0.025 | 0.7854 | ±6 | 0.624 | 143 | 6.99 |
| 0.90 | ±0.025 | 0.6362 | ±6 | 0.770 | 177 | 5.66 |
| 0.85 | ±0.025 | 0.5675 | ±6 | 0.864 | 198 | 5.05 |
| 0.80 | ±0.020 | 0.5027 | ±6 | 0.975 | 224 | 4.47 |
| 0.75 | ±0.020 | 0.4418 | ±6 | 1.11 | 254 | 3.93 |
| 0.70 | ±0.020 | 0.3848 | ±6 | 1.27 | 292 | 3.43 |
| 0.65 | ±0.020 | 0.3318 | ±6 | 1.48 | 339 | 2.95 |
| 0.60 | ±0.020 | 0.2827 | ±6 | 1.73 | 397 | 2.52 |
| 0.55 | ±0.016 | 0.2376 | ±7 | 2.06 | 473 | 2.11 |
| 0.50 | ±0.016 | 0.1964 | ±7 | 2.50 | 572 | 1.75 |
| 0.45 | ±0.016 | 0.1590 | ±7 | 3.08 | 706 | 1.42 |
| 0.40 | ±0.016 | 0.1257 | ±7 | 3.90 | 894 | 1.12 |
| 0.35 | ±0.013 | 0.09621 | ±7 | 5.09 | 1168 | 0.856 |
| 0.32 | ±0.013 | 0.08042 | ±7 | 6.09 | 1397 | 0.716 |
| 0.29 | ±0.013 | 0.06605 | ±7 | 7.42 | 1701 | 0.588 |
| 0.26 | ±0.010 | 0.05309 | ±8 | 9.23 | 2116 | 0.473 |
| 0.23 | ±0.010 | 0.04155 | ±8 | 11.8 | 2704 | 0.370 |
| 0.20 | ±0.010 | 0.03142 | ±8 | 15.6 | 3577 | 0.280 |
| 0.18 | ±0.008 | 0.02545 | ±8 | 19.3 | 4415 | 0.226 |
| 0.16 | ±0.008 | 0.02011 | ±8 | 24.4 | 5588 | 0.179 |
| 0.15 | ±0.008 | 0.01767 | ±8 | 27.7 | 6358 | 0.157 |
| 0.14 | ±0.008 | 0.01539 | ±8 | 31.8 | 7299 | 0.137 |
| 0.13 | ±0.006 | 0.01327 | ±9 | 36.9 | 8465 | 0.118 |
| 0.12 | ±0.006 | 0.01131 | ±9 | 43.3 | 9935 | 0.101 |
| 0.11 | ±0.006 | 0.009503 | ±9 | 51.6 | 11823 | 0.0846 |
| 0.10 | ±0.006 | 0.007854 | ±9 | 62.4 | 14306 | 0.0699 |
| 0.09 | ±0.005 | 0.006362 | ±10 | 77.0 | 17662 | 0.0566 |
| 0.08 | ±0.005 | 0.005027 | ±10 | 97.5 | 22353 | 0.0447 |
| 0.07 | ±0.005 | 0.003848 | ±10 | 127 | 29196 | 0.0343 |
| 0.06 | ±0.004 | 0.002827 | ±11 | 173 | 39739 | 0.0252 |
| 0.05 | ±0.004 | 0.001964 | ±11 | 250 | 57224 | 0.0175 |
| 0.04 | ±0.003 | 0.001257 | ±12 | 390 | 89413 | 0.0112 |
| 0.03 | ±0.003 | 0.0007069 | ±12 | 693 | 158956 | 0.00629 |
| 0.025 | ±0.002 | 0.0004909 | ±13 | 998 | 228896 | 0.00437 |

CN49W【温度電流特性 線径・温度・電流表】

丸線 体積抵抗率(23°CμΩm)0.49±0.03 [単位:アンペア]

| 線径 (mm) | 50 (°C) | 100 (°C) | 150 (°C) | 200 (°C) | 250 (°C) | 300 (°C) | 350 (°C) | 400 (°C) |
|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 6.00 | 23.0 | 33.0 | 59.6 | 75.0 | 90.2 | 106 | 121 | 138 |
| 5.50 | 20.6 | 37.9 | 52.4 | 66.0 | 79.3 | 93.3 | 107 | 122 |
| 5.00 | 17.8 | 32.8 | 45.5 | 57.4 | 68.9 | 81.0 | 92.8 | 105 |
| 4.50 | 15.3 | 28.2 | 39.0 | 49.2 | 59.1 | 69.6 | 79.6 | 90.5 |
| 4.00 | 13.3 | 24.6 | 34.2 | 42.8 | 51.2 | 60.2 | 68.7 | 77.8 |
| 3.50 | 11.0 | 20.3 | 28.1 | 35.3 | 42.2 | 49.5 | 56.6 | 64.1 |
| 3.20 | 9.60 | 17.7 | 24.5 | 31.0 | 37.0 | 43.3 | 49.4 | 56.2 |
| 2.90 | 8.33 | 15.8 | 21.4 | 26.8 | 32.0 | 37.6 | 42.9 | 48.7 |
| 2.60 | 7.46 | 13.7 | 18.8 | 23.7 | 28.2 | 33.0 | 37.8 | 42.5 |
| 2.30 | 6.24 | 11.4 | 15.9 | 19.8 | 23.7 | 27.6 | 31.6 | 35.5 |
| 2.00 | 5.10 | 9.36 | 12.9 | 16.2 | 19.3 | 22.6 | 25.8 | 29.1 |
| 1.80 | 4.65 | 8.46 | 11.6 | 14.5 | 17.3 | 20.1 | 22.9 | 25.9 |
| 1.60 | 3.94 | 7.17 | 9.87 | 12.3 | 14.6 | 17.1 | 19.4 | 21.8 |
| 1.50 | 3.58 | 6.52 | 8.98 | 11.2 | 13.3 | 15.6 | 17.6 | 19.9 |
| 1.40 | 3.25 | 5.91 | 8.14 | 10.2 | 12.1 | 14.1 | 16.1 | 18.0 |
| 1.30 | 3.06 | 5.57 | 7.68 | 9.60 | 11.3 | 13.2 | 15.0 | 16.7 |
| 1.20 | 2.72 | 5.00 | 6.82 | 8.53 | 10.1 | 11.7 | 13.3 | 14.9 |
| 1.10 | 2.50 | 4.42 | 6.05 | 7.53 | 8.93 | 10.4 | 11.7 | 13.2 |
| 1.00 | 2.12 | 3.88 | 5.30 | 6.62 | 7.85 | 9.09 | 10.3 | 11.6 |
| 0.90 | 1.80 | 3.30 | 4.61 | 5.63 | 6.67 | 7.73 | 8.76 | 9.82 |
| 0.80 | 1.63 | 3.00 | 4.09 | 5.10 | 6.03 | 6.94 | 7.86 | 8.55 |
| 0.70 | 1.35 | 2.49 | 3.38 | 4.22 | 5.01 | 5.76 | 6.51 | 7.09 |
| 0.65 | 1.21 | 2.24 | 3.05 | 3.80 | 4.50 | 5.18 | 5.87 | 6.38 |
| 0.60 | 1.14 | 2.12 | 2.89 | 3.59 | 4.24 | 4.86 | 5.48 | 6.07 |
| 0.55 | 1.02 | 1.88 | 2.56 | 3.19 | 3.76 | 4.32 | 4.87 | 5.38 |
| 0.50 | 0.890 | 1.66 | 2.25 | 2.79 | 3.30 | 3.97 | 4.28 | 4.72 |
| 0.45 | 0.733 | 1.43 | 1.95 | 2.44 | 2.87 | 3.29 | 3.70 | 4.10 |
| 0.40 | 0.701 | 1.30 | 1.77 | 2.19 | 2.58 | 2.95 | 3.32 | 3.68 |
| 0.35 | 0.587 | 1.09 | 1.49 | 1.83 | 2.17 | 2.47 | 2.79 | 3.09 |
| 0.32 | 0.522 | 0.969 | 1.32 | 1.64 | 1.93 | 2.20 | 2.47 | 2.75 |
| 0.29 | 0.459 | 0.851 | 1.16 | 1.43 | 1.69 | 1.94 | 2.17 | 2.40 |
| 0.26 | 0.426 | 0.785 | 1.07 | 1.32 | 1.55 | 1.77 | 1.97 | 2.19 |
| 0.23 | 0.366 | 0.672 | 0.914 | 1.13 | 1.33 | 1.51 | 1.70 | 1.87 |
| 0.20 | 0.303 | 0.557 | 0.757 | 0.943 | 1.10 | 1.25 | 1.40 | 1.50 |
| 0.18 | 0.272 | 0.503 | 0.684 | 0.843 | 0.987 | 1.13 | 1.26 | 1.42 |
| 0.16 | 0.230 | 0.427 | 0.574 | 0.716 | 0.863 | 0.956 | 1.07 | 1.20 |
| 0.15 | 0.214 | 0.396 | 0.537 | 0.664 | 0.776 | 0.888 | 0.989 | 1.11 |
| 0.14 | 0.195 | 0.360 | 0.490 | 0.604 | 0.706 | 0.808 | 0.900 | 1.01 |
| 0.13 | 0.185 | 0.337 | 0.459 | 0.567 | 0.662 | 0.765 | 0.842 | 0.927 |
| 0.12 | 0.163 | 0.302 | 0.413 | 0.509 | 0.594 | 0.678 | 0.750 | 0.832 |
| 0.11 | 0.145 | 0.270 | 0.367 | 0.459 | 0.528 | 0.602 | 0.670 | 0.738 |
| 0.10 | 0.126 | 0.233 | 0.317 | 0.392 | 0.458 | 0.523 | 0.583 | 0.644 |
| 0.09 | 0.112 | 0.207 | 0.281 | 0.347 | 0.406 | 0.463 | 0.516 | 0.567 |
| 0.08 | 0.0975 | 0.181 | 0.247 | 0.305 | 0.353 | 0.403 | 0.450 | 0.488 |
| 0.07 | 0.0814 | 0.151 | 0.220 | 0.256 | 0.291 | 0.338 | 0.376 | 0.412 |
| 0.06 | 0.0685 | 0.127 | 0.172 | 0.201 | 0.246 | 0.282 | 0.312 | 0.344 |
| 0.05 | 0.0533 | 0.0688 | 0.134 | 0.164 | 0.192 | 0.219 | 0.244 | 0.268 |
| 0.04 | 0.0398 | 0.0742 | 0.100 | 0.123 | 0.144 | 0.164 | 0.182 | 0.201 |
| 0.03 | 0.0269 | 0.0502 | 0.0679 | 0.0834 | 0.0978 | 0.111 | 0.123 | 0.136 |
| 0.025 | 0.0217 | 0.0402 | 0.0543 | 0.0668 | 0.0782 | 0.0886 | 0.0981 | 0.108 |

注(*)参考値

CN49R【導体抵抗】

帯

体積抵抗率 (23°CμΩm) 0.49±0.03

[単位:Ω/m]

| 厚さ (mm) | 幅(mm) | | | | | | | | | | | | | |
|------------|---------|---------|---------|---------|--------|--------|--------|--------|--------|-------|-------|-------|------|------|
| | 40.0 | 32.0 | 25.0 | 20.0 | 16.0 | 13.0 | 10.0 | 6.5 | 5.0 | 3.2 | 2.4 | 1.6 | 0.8 | 0.4 |
| 2.90 | 0.00431 | 0.00539 | 0.00690 | 0.00862 | 0.0108 | 0.0133 | 0.0172 | | | | | | | |
| 2.60 | 0.00481 | 0.00601 | 0.00769 | 0.00962 | 0.0120 | 0.0148 | 0.0192 | 0.0302 | | | | | | |
| 2.30 | 0.00543 | 0.00679 | 0.0087 | 0.0109 | 0.0136 | 0.0167 | 0.0217 | 0.0341 | 0.0444 | | | | | |
| 2.00 | 0.00625 | 0.00781 | 0.0100 | 0.0125 | 0.0156 | 0.0192 | 0.0250 | 0.0393 | 0.0510 | | | | | |
| 1.80 | 0.00694 | 0.00868 | 0.0111 | 0.0139 | 0.0174 | 0.0214 | 0.0278 | 0.0436 | 0.0567 | | | | | |
| 1.60 | 0.00781 | 0.00977 | 0.0125 | 0.0156 | 0.0195 | 0.0240 | 0.0313 | 0.0491 | 0.0638 | | | | | |
| 1.40 | 0.00893 | 0.0112 | 0.0143 | 0.0179 | 0.0223 | 0.0275 | 0.0357 | 0.0561 | 0.0729 | | | | | |
| 1.20 | 0.0104 | 0.0130 | 0.0167 | 0.0208 | 0.0260 | 0.0321 | 0.0417 | 0.0654 | 0.0851 | | | | | |
| 1.00 | 0.0125 | 0.0156 | 0.0200 | 0.0250 | 0.0313 | 0.0385 | 0.0500 | 0.0785 | 0.102 | | | | | |
| 0.90 | | 0.0174 | 0.0222 | 0.0278 | 0.0347 | 0.0427 | 0.0556 | 0.0873 | 0.113 | 0.177 | 0.236 | | | |
| 0.80 | | 0.0195 | 0.0250 | 0.0313 | 0.0391 | 0.0481 | 0.0625 | 0.0982 | 0.128 | 0.199 | 0.266 | | | |
| 0.70 | | | 0.0286 | 0.0357 | 0.0446 | 0.0549 | 0.0714 | 0.112 | 0.146 | 0.228 | 0.304 | | | |
| 0.60 | | | 0.0333 | 0.0417 | 0.0521 | 0.0641 | 0.0833 | 0.131 | 0.170 | 0.266 | 0.354 | | | |
| 0.50 | | | 0.0400 | 0.0500 | 0.0625 | 0.0769 | 0.100 | 0.157 | 0.204 | 0.319 | 0.425 | | | |
| 0.45 | | | 0.0444 | 0.0556 | 0.0694 | 0.0855 | 0.111 | 0.175 | 0.227 | 0.354 | 0.473 | 0.709 | | |
| 0.40 | | | | | 0.0781 | 0.0962 | 0.125 | 0.196 | 0.255 | 0.399 | 0.532 | 0.798 | | |
| 0.35 | | | | | | 0.110 | 0.143 | 0.224 | 0.292 | 0.456 | 0.608 | 0.911 | | |
| 0.32 | | | | | | 0.120 | 0.156 | 0.245 | 0.319 | 0.498 | 0.665 | 1.00 | | |
| 0.29 | | | | | | | 0.172 | 0.271 | 0.352 | 0.550 | 0.733 | 1.10 | 2.20 | |
| 0.26 | | | | | | | 0.192 | 0.302 | 0.393 | 0.613 | 0.818 | 1.23 | 2.45 | 4.91 |
| 0.23 | | | | | | | | 0.341 | 0.444 | 0.694 | 0.925 | 1.39 | 2.77 | 5.55 |
| 0.20 | | | | | | | | 0.393 | 0.510 | 0.798 | 1.06 | 1.60 | 3.19 | 6.38 |
| 0.18 | | | | | | | | 0.436 | 0.567 | 0.886 | 1.18 | 1.77 | 3.54 | 7.09 |
| 0.16 | | | | | | | | | | 0.997 | 1.33 | 1.99 | 3.99 | 7.98 |
| 0.14 | | | | | | | | | | 1.14 | 1.52 | 2.28 | 4.56 | 9.11 |
| 0.12 | | | | | | | | | | | 1.77 | 2.66 | 5.32 | 10.6 |
| 0.10 | | | | | | | | | | | | 3.19 | 6.38 | 12.8 |
| 0.08 | | | | | | | | | | | | 3.99 | 7.98 | 16.0 |

※ 導体抵抗許容差:幅 10mm以上±7% 幅10mm未満±8%

電熱用合金の寸法並びに導体抵抗の許容差 (JIS 標準値)

| 帯の厚さ [mm] | 帯の幅 [mm] | 導体抵抗許容差 [%] |
|---------------|-------------|----------------|
| 0.08以上 3.15以下 | 10未満 | ±8 |
| | 10以上 | ±7 |

※標準(サイズ・許容差)以外も製造いたしますのでお問い合わせください。