

# HM Wire International, Inc.

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## Alloy 205 - Nickel Alloy

**Description:** Nickel Alloy 205 is a wrought nickel alloy having controlled additions of small amounts of magnesium and titanium. Alloy 205 exhibits an excellent combination of mechanical, electrical and corrosion-resistant properties. It also has good oxidation resistance.

**Applications:** Nickel Alloy 205 has been used in various electronic components such as vacuum tube components, pins, terminals, support wires, lead wires, shields, and tubes.

|                             |             |                  |            |             |            |            |            |
|-----------------------------|-------------|------------------|------------|-------------|------------|------------|------------|
| <b>Nominal Composition:</b> | <b>C%</b>   | <b>S%</b>        | <b>Cu%</b> | <b>Mg%</b>  | <b>Fe%</b> | <b>Mn%</b> | <b>Si%</b> |
|                             | 0.07        | 0.008            | 0.15       | 0.01 - 0.08 | 0.20       | 0.35       | 0.15       |
|                             | <b>Ti%</b>  | <b>Ni% + Co%</b> |            |             |            |            |            |
|                             | 0.01 - 0.05 | 99.00            |            |             |            |            |            |

## Physical Properties

|  |  |
|--|--|
| <b>Specific Gravity</b>                      | 8.89                                       |
| <b>Density</b>                               | 0.3210 lb/cu in                            |
| <b>Mean Specific Heat</b>                    | 0.1080 Btu/lb/°F                           |
| <b>Mean CTE - 77 to 212°F</b>                | $7.22 \times 10^{-6}$ in/in/°F             |
| <b>Thermal Conductivity - 73°F</b>           | 306.0 BTU-in/hr/ft <sup>2</sup> /°F        |
| <b>Modulus of Elasticity - In Tension</b>    | $30.0 \times 10^3$ ksi                     |
| <b>Electrical Resistivity - 70°F</b>         | 57.00 ohm-cir-mil/ft                       |
| <b>Temp. Coeff. Of Electrical Resistance</b> | $22.2$ to $27.8 \times 10^{-4}$ Ohm/Ohm/°F |
| <b>Curie Temperature</b>                     | 680°F                                      |
| <b>Melting Range</b>                         | 2620°F                                     |

## Mechanical Properties

| <b>Condition</b>      | <b>Ultimate Tensile Strength</b> | <b>Yield Strength</b> | <b>% Elongation in 2"</b> |
|-----------------------|----------------------------------|-----------------------|---------------------------|
|                       | <b>ksi</b>                       | <b>ksi</b>            |                           |
| <b>Rod</b>            |                                  |                       |                           |
| Cold Drawn            | 90                               | 72                    | 20                        |
| Cold Drawn & Annealed | 70                               | 30                    | 45                        |
| <b>Wire</b>           |                                  |                       |                           |
| Cold Drawn & Annealed | 70                               | 32                    | 40                        |
| Regular Temper        | 122                              | 118                   | 10                        |
| Spring Temper         | 135                              | 120                   | 8                         |
| <b>Strip</b>          |                                  |                       |                           |
| Annealed              | 65                               | 25                    | 35                        |
| Cold Rolled           | 110                              | 95                    | 5                         |

\*To be used as a guideline only.