

# STRAIN GAUGES

## PRECISION RESISTOR ALLOY FOIL

### TECHNICAL DATASHEET

We are experts in manufacturing precision resistor alloy foil used for strain gauges. Foil strain gauges are used as the active element in the production of electronic load cells, for structural stress analysis and other load or force-sensing applications.

#### ALLOYS

Hamilton Precision Metals supplies the leading strain gauge manufacturers with a range of materials, including:

- Constantan
- Evanohm® R
- Nickel 270 (N02270)

We stock Constantan alloy with a variety of thermal coefficients of resistance (TCR) to match aluminum, mild steel or stainless steel load-cell spring elements. Samples are available for heat evaluation and approval.

#### SIZES

At Hamilton Precision Metals, we engineer precision foil down to 0.0001" (0.0025mm) thickness and up to 4" (101mm) wide. Custom sizes are available on request.

#### ADVANTAGES

Our advanced materials deliver significant advantages for strain gauge manufactures including:

- Ultra-smooth and clean surface for bonding
- Low level of pinholes
- Ultra-tight thickness control



#### APPLICATIONS

Strain gauges have been in use for decades in the instrumentation and measurement markets. They provide a reliable and robust means of measuring pressure, force, tension and torsion. A gauge is attached to an object, which when under strain, causes the gauge to produce an output voltage signal from the change in resistance of the etched foil grid. This output signal is detected and measured by appropriate instrumentation.

#### UNMANNED VENDING MACHINES

We engineer specialty metal foils for strain gauges to operate as gravity sensors in unmanned vending machines. The ultra-thin precision foils separate the products stacked within the independent grids of vending machines to help to automatically calculate weights in order to process payments.

#### MULTIDIMENSIONAL FORCE SENSING

Our strain gauge foils are used in multidimensional force sensing, innovative measurement and control solutions for consumer electronics. Applications include touch screens for devices and force sensors for pedal force electrical bikes.



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#### CONSTANTAN

NOMINAL COMPOSITION	
Nickel	44.2%
Manganese	1.5%
Iron	0.50%
Copper	Balance

PHYSICAL PROPERTIES	
Temperature Coefficient of Resistivity (TCR) (25° to 105°C)	± 30 PPM/°C

#### EVANOHM® R

NOMINAL COMPOSITION	
Chromium	20.0%
Aluminum	2.8%
Copper	2.0%
Silicon	1.0%
Manganese	0.90%
Zirconium	0.08%
Nickel	Balance

PHYSICAL PROPERTIES	
Temperature Coefficient of Resistivity (TCR) (-55°C to 105°C) - Heat Treated	±10 PPM/°C

#### Ni 270

NOMINAL COMPOSITION	
Nickel	99.9%
Manganese	0.01%
Iron	0.01%
Carbon	0.01%

PHYSICAL PROPERTIES	
Temperature Coefficient of Resistivity (TCR) (0°C to 25°C)	6000 ppm/°C



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