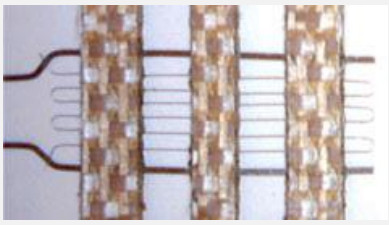
Product Data Sheet



HFH-12-250-ZHW

HFH Series > High Temperature Bondable Strain Gages

Maximum operating temperature: 1500°F (816°C)

Description: Wire resistance strain gages, constructed of an iron chrome aluminum alloy (Hoskins 875™).

Features: High resistivity and excellent oxidation resistance.

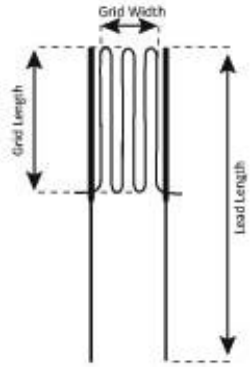
Uses: Recommended for high temperature static measurements where a compensating gage, half bridge, or full bridge configuration is required.

AVAILABLE IN THE FOLLOWING CONFIGURATIONS

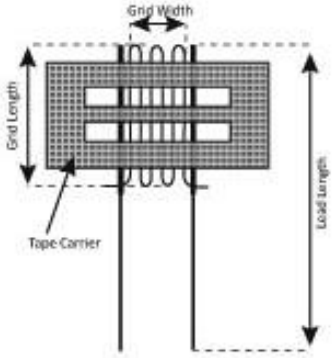
Application Methods

Free filament gages are bonded to components using flame sprayed rod or powder, or with a ceramic cement application.

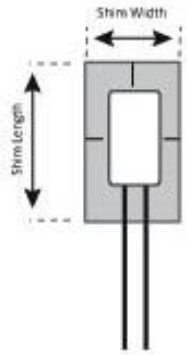
Weldable gages are attached to the component using a capacitive fine-spot welder.



Tapeless free filament gage with lead wires



Free filament gage with temporary tape carrier



Pre-installed weldable strain gage

For more info about weldable strain gages, please see our High Temperature Weldable data sheets.

STANDARD PART NUMBERS

Standard Part Numbers	Strain Type	Gage Resistance (nominal)	Gage Factor (nominal)	Grid Length	Grid Width	Lead Wire	Lead Length	Lead Type	Specification Drawing
HFH-12-250-SHW	Static	120 Ohms	2.0	.250”	.060”	.003” Hoskins 875™	2.75”	Straight	50-520
HFH-12-125-SHW	Static	120 Ohms	2.0	.125”	.060”	.003” Hoskins 875™	2.75”	Straight	50-521
HFH-12-063-SHW	Static	120 Ohms	2.0	.063”	.070”	.003” Hoskins 875™	2.75”	Straight	50-522

Standard gage configurations can be customized for individual application needs. Please see the following options table for custom orders; then consult our sales and/or engineering department to confirm availability and compatibility with your application.

CUSTOM OPTIONS TABLE

Gage Resistance	Grid Length	Lead Length
12 – 120 Ohms	063 – 1/16”	Standard – 2.75"
35 – 350 Ohms	125 – 1/8”	Custom – 2.75" – 12"
	250 – 1/4”	

Lead Wire Configurations

SPW …….	0.003” Platinum-Nickel
LPW …….	0.005” PT 10 RHO
SCW …….	0.003” Chromel A[2]
LCW …….	0.005” Chromel A
SNR …….	0.003” x 0.015” NiChrome Ribbon
SMW …….	0.003” Moleculoy Wire
SHW …….	0.003” Hoskins 875
LHW …….	0.005” Hoskins 875
ISMW …….	0.003” Moleculoy wire – inboard configuration with straight lead wire
ICMW …….	0.003” Moleculoy wire – inboard configuration with convoluted lead wire

Packaging: Strain gages are supplied on glass slides , and sold in packages of 5.

Lead Wires: Standard design is a straight, 2.75” length lead. For custom lead lengths and configurations, please consult the Custom Options Table.

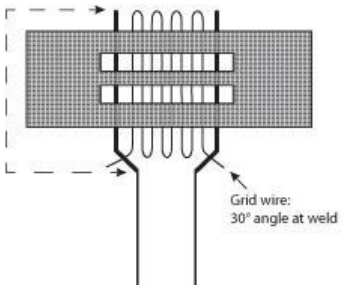
Lead Configurations: High fatigue Z-type leads can be custom ordered for most gages. Consult our sales department for more information.

Tape Carrier: Fiberglass reinforced Teflon with silicone adhesive. Shelf life: 9 months (adhesive)

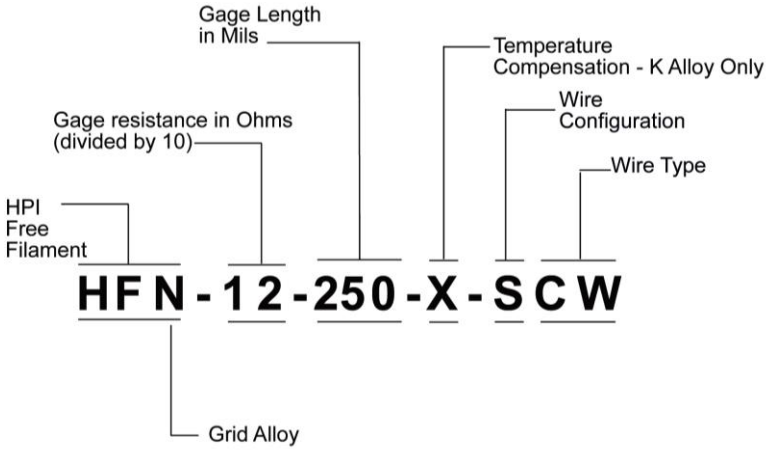
Fatigue Life (nominal)**:** 1 x 10^6 cycles at ± 750µ"/" at room temperature.

Z-LEAD CONFIGURATION

Wire in this area is flattened to .0015” and angled for better stability for long leads (to prevent twisting and rolling)

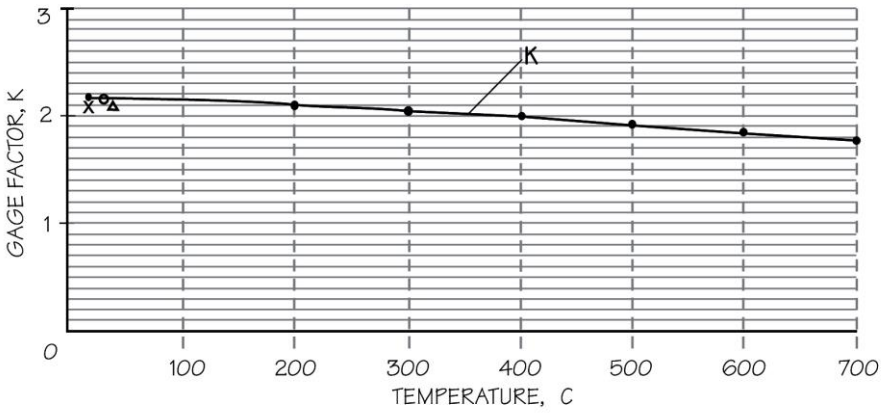


Part Number Designation Code:



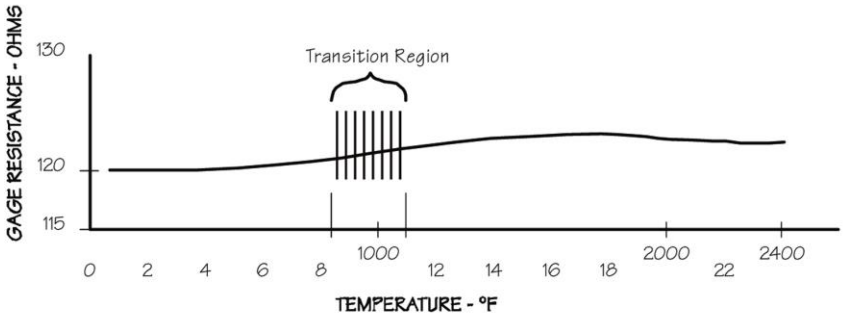
ENGINEERING DATA

Resistivity @ 20°C (68°F): ……..875, ohms – cmf
Max. Operating Temperature: ……..816°C (1500°F)
Thermal Expansion, ppm/°F: ……..20 – 250°C = 6.1 (68 – 482°F)
20 – 500°C = 6.9 (68 – 932°F)
20 – 750°C = 7.7 (68 – 1382°F)
20 – 1000°C = 8.3 (68 – 1832°F)
Gage Factor K @ 20°C (68°F)……2.3 – 2.6
Gage Factor vs. Temperature Coefficient: ……-5.73×10^{-4}/°C
Tensile Strength, PSI: ……140,000 (hard), 92,000 (soft)
Thermoelectric Potential vs. Cu: ……..-2.6µV/°C (0-100°C)



Gage Factor (K) vs. Temperature*

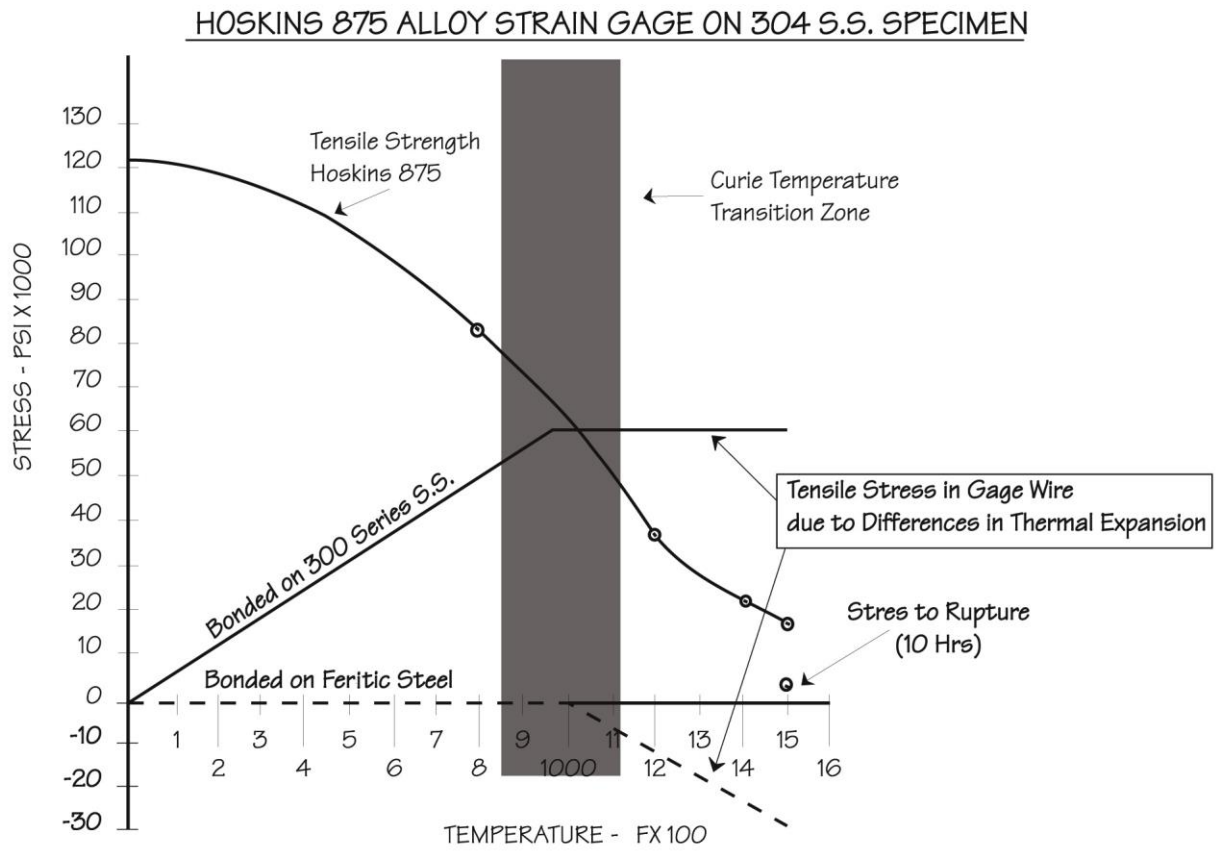
• -20, 200, 300, 400, 500, 600, 700 C
x, O, Δ -20 C after 400, 500, 600 respectively



NOTES

1. Caution should be exercised when bonding to high expansion materials, as in the example shown below. From the stress vs. temperature curve, an Fe Cr Al alloy wire bonded to an austenitic stainless steel will induce tensile stress in the wire because of the differences in thermal expansion (9ppm/°F for austenitic stainless steel and 6 ppm/°F for ferritic Fe Cr Al wire). Above the curie temperature, both materials expand the same and result in no additional induced stress with increased temperature. Note the thermally induced stress at 1500°F is well above the 10 hour stress to rupture point and hence early failure at high temperature on high expansion materials is expected. For gages bonded to a 6 ppm/°F ferritic or similar material, no thermally induced stress exists until the gage is taken above the curie temperature whereby the wire goes into compression as the temperature is increased. Therefore, Fe Cr Al gages should be used primarily on low expansion materials.

2. Rapid heating or cooling should be avoided while in the transition zone. Rates > 25°F/sec, (14°C/sec) are excessive and may cause a change in the resistance temperature curve of the sensor wire. The temperature differences between gages in the bridge should also be minimal.



For current pricing on strain gages and installation products, please contact our Sales Dept. or 978-772-6963