

# HM Wire International, Inc.

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## Alloy 875: FeCrAl Alloy

**Description:** Ferritic iron-chromium-aluminum alloy (FeCrAl Alloy) which is recommended for use at element temperatures up to 1400°C (2550°F)

**Applications:** Typical Applications are as electrical heating elements in industrial furnaces.

## Chemical Composition

Nominal Composition	C %	Si %	Mn %	Cr %	Al %	Fe %
					5.8	Bal.
Min	~	~	~	20.5	~	
Max	0.08	0.7	0.4	23.5	~	

## Mechanical Properties

Thickness	Yield Strength Rp0.2 Mpa	Tensile Strength Rm Mpa	Elongation A %	Hardness Hv
mm				
1.5	460	670	22	225

## Mechanical Properties at elevated Temperature

Temperature °C Mpa	900	1000	1100	1200	1300
	34	18	10	6	4

Ultimate tensile strength - deformation rate 6.2 x 10<sup>-2</sup> min<sup>-1</sup>

### Creep Strength - 1% elongation in 1000 h

Temperature °C Mpa	800	1000
	1.2	0.5

\*To be used as a guideline only

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## Physical Properties

Density g / cm <sup>3</sup>	7.10
Electrical Resistivity at 20°C Ω mm <sup>2</sup> / m	1.45
Poisson's ratio	0.30

### Young's Modulus

Temperature °C	20	100	200	400	600	800	1000
GPa	220	210	205	190	170	150	130

### Temperature Factor of resistivity

Temperature °C	100	200	300	400	500	600	700	800	1000
Ct	1.00	1.00	1.00	1.00	1.01	1.02	1.02	1.03	1.04

### Coefficient of thermal expansion

Temperature °C	Thermal Expansion x 10 <sup>-6</sup> / K	
20-250	11	
20-500	12	
20-750	14	
20-1000	15	

### Thermal Conductivity

Temperature °C	50	600	800	1000	1200	1400
W m <sup>-1</sup> K <sup>-1</sup>	11	20	22	26	27	35

### Specific Heat Capacity

Temperature °C	20	200	400	600	800	1000	1200	1400
kJ kg <sup>-1</sup> K <sup>-1</sup>	0.46	0.56	0.63	0.75	0.71	0.72	0.74	0.80

Melting Point C°	1500
Max continuous operating temp in air C°	1400
Magnetic Properties	The Material is magnetic up to approx. 600°C (Curie point).
Emissivity - fully oxidated material	0.70

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