



Brand Name	RESISTHERM				
Material Code	1)				
Abbreviation	NiFe30				
Chemical Composition (mass components) in %. Average values of alloy components					
Ni	Fe	Al	Mn	Cr	
Rem.	30	0.6	0.5	0.3	

Features and Application Notes

RESISTHERM is well known for having a high temperature coefficient at a relatively high resistivity. Up to +600 °C, this alloy is ferromagnetic. It is mainly used in wire form for temperature-dependent resistors. Also for shielded resistors for spark-plug connectors as well as self-regulating heaters. The maximum working temperature in air is +800 °C.

Form of Delivery

RESISTHERM is supplied in the form of round wires in the range 0.02 to 0.25 mm Ø in bare, oxidized or enamelled condition and also in the form of stranded wires.

Electrical Resistance in Annealed Condition

Temperature coefficient of electrical resistance between 0 °C and +100 °C 10 ⁻⁶ /K	Electrical resistivity in: µΩ x cm (first line) and Ω/CMF (second line) Reference Values					
	+20 °C tolerance ±5 %	+100 °C	+200 °C	+300 °C	+400 °C	+500 °C
approx. +3,200	33	41	52	64	76	89
	199	247	313	385	457	535

Physical Characteristics (Reference Values)

Density at +20 °C		Melting point °C	Specific heat at +20 °C J/g K	Thermal conductivity at +20 °C W/m K	Average linear thermal expansion coefficient between +20 °C and		Thermal EMF against copper at +20 °C µV/K
g/cm ³	lb/cub in				+100 °C	+400 °C	
8.50	0.31	+1,400	0.42	25	12	13	-27

Strength Properties at +20 °C in Annealed Condition

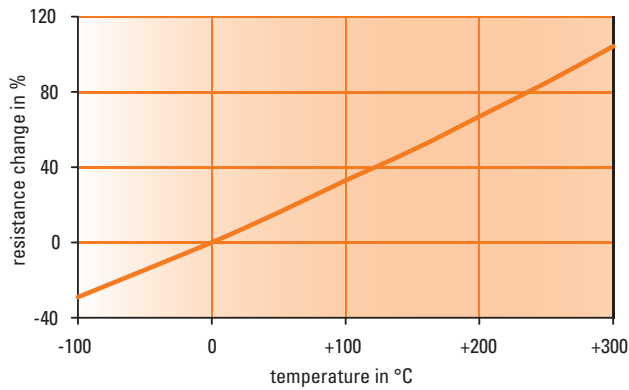
Tensile Strength ²⁾		Elongation (L ₀ = 100 mm) % at nominal diameter in mm				
MPa	psi	0.020 to 0.063	> 0.063 to 0.125	> 0.125 to 0.50	> 0.50 to 1.00	> 1.00
600	87,000	≈ 8	≈ 15	≈ 20	≥ 20	≥ 30

Notes on Treatment // RESISTHERM can easily be spot-welded. Under certain conditions it can also be soldered and brazed (see Technical Information).

Special Remarks on the Temperature Coefficient // The variation of the electrical resistance vs. temperature in the range between -100 and +300 °C, referred to 0 °C, is shown in graph 1.

1) RESISTHERM is not a standardized alloy.

2) This value applies to wires of 2.0 mm diameter. For thinner wires the minimum values will substantially increase, depending on the dimensions.



Graph 1: Electrical resistance vs. temperature (range -100 °C to +300 °C)

Nominal Diameter mm	Cross Section mm ²	Weight per 1,000 m g	DC Resistance Referred to Length at +20 °C Ω/m				
			Nominal Value	Tolerance	Minimum Value	Maximum Value	
0.020	0.0003142	2.67	1,050	±10 %	945	1,156	
0.022	0.0003801	3.23	868		781	955	
0.025	0.0004909	4.17	672		605	740	
0.028	0.0006158	5.23	536		482	590	
0.030	0.0007069	6.01	467		430	504	
0.032	0.0008042	6.84	410		378	443	
0.036	0.001018	8.65	324		298	350	
0.040	0.001257	10.70	263		242	284	
0.045	0.001590	13.50	208		191	224	
0.050	0.001963	16.70	168		155	182	
0.056	0.002463	20.90	134	±8 %	123	145	
0.060	0.002827	24.00	117		107	126	
0.063	0.003117	26.50	106		97.4	114	
0.070	0.003848	32.70	85.7		78.9	92.6	
0.071	0.003959	33.70	83.4		76.7	90.0	
0.080	0.005027	42.70	65.7		60.4	70.9	
0.090	0.006362	54.10	51.9		47.7	56.0	
0.100	0.007854	66.80	42.0		38.7	45.4	
0.110	0.009503	80.80	34.7		32.3	37.2	
0.1120	0.009852	83.70	33.5		31.2	35.8	
0.120	0.01131	96.10	29.2	27.1	31.2		
0.125	0.01227	104.00	26.9	25.0	28.8		
0.130	0.01327	113.00	24.9	±7 %	23.1	26.6	
0.140	0.01539	131.00	21.4		19.9	22.9	
0.150	0.01767	150.00	18.7		17.4	20.0	
0.160	0.02011	171.00	16.4		15.3	17.6	
0.180	0.02545	216.00	13.0		12.1	13.9	
0.200	0.03142	267.00	10.5		9.87	11.1	
0.220	0.03801	323.00	8.68		±6 %	8.16	9.20
0.224	0.03941	335.00	8.37			7.87	8.88
0.250	0.049087	417.00	6.72			6.32	7.13

