

**Controlled Expansion & Glass Sealing Alloys****Alloy 42 & Alloy 48**

Alloys 42 and 48 are nickel-iron controlled expansion alloys with high magnetic permeability.

Alloy 42 has low expansion up until 300°C and it matches the expansion properties of soft glass. It is typically used in lead wires for electronic applications.

Alloy 48 has expansion properties which match soda-lead and soda lime glass.

Nominal Chemical Composition		
Alloy 42	58% Fe	42% Ni
Alloy 48	52% Fe	48% Ni

Mechanical Properties			
	Tensile Strength	Yield Strength	Elongation
Alloy 42	525N/mm ²	247N/mm ²	30%
Alloy 48	550N/mm ²	247N/mm ²	30%

Physical Properties			
	Density	Curie Temperature	Melting Point
Alloy 42	8.11 gcm ⁻³	380°C	1427°C
Alloy 48	8.3 gcm ⁻³	471°C	1427°C

Thermal Properties									
Coefficient of Expansion									
Temperature Range			Alloy 42	Alloy 48	Temperature Range			Alloy 42	Alloy 48
25°C	to	100°C	4.8	9.4	25°C	to	500°C	8	9.4
25°C	to	200°C	4.5	9.4	25°C	to	600°C	9.5	10.4
25°C	to	300°C	4.5	8.8	25°C	to	700°C	10.5	11.3
25°C	to	350°C	5	9	25°C	to	800°C	11.4	12.1
25°C	to	400°C	6	8.2-9.2	25°C	to	900°C	12.3	13
25°C	to	450°C	7.1	9					

Thermal Conductivity	
Alloy 42	13 Wm ⁻¹ K ⁻¹
Alloy 48	16 Wm ⁻¹ K ⁻¹

Electrical Properties	Electrical Resistivity
Alloy 42	71 uOhm cm
Alloy 48	48.2 uOhm cm