

# PRECISION C



## PRECISION C (UNS N09902)

Precision C is a heat treatable Nickel-Iron Alloy used in critical diaphragm applications. The alloy composition provides a unique constant elastic modulus value over a temperature range of -50°F to 150°F.

### GENERAL INFORMATION

Precision C can be readily formed from the annealed temper. It has a work hardening rate similar to austenitic stainless steel. The material can be joined by TIG, EB, and resistance welding as well as by brazing and soft solder technique. The heat treatment of Precision C can be adjusted to produce the desired value for the thermoelastic coefficient at or near zero. The elevated strength in the heat treated temper results in low mechanical hysteresis and low drift.

### AVAILABILITY

Precision C is available from Hamilton Precision Metals as strip product in thickness from 0.0005" to 0.040" (0.0127 mm to 1.016 mm) and widths up to 8.0" (203.2 mm). The material conforms to ASM 5221 and UNS N09902.



## Technical Data

TYPICAL MECHANICAL PROPERTIES <sup>1</sup>				
	ANNEALED	ANNEAL/HEAT TREAT 1250°F / 3½ HRS	50% COLD ROLLED	50% C.R./HEAT TREAT 1200°F / 2½ HRS
Ultimate Tensile Strength	95,000 PSI	170,000 PSI	140,000 PSI	200,000 PSI
Yield Strength (0.2% Offset)	40,000 PSI	110,000 PSI	130,000 PSI	180,000 PSI
Elongation in 2" *	35%	18%	6%	7%
Proportional Limit	15,000 PSI	65,000 PSI	55,000 PSI	110,000 PSI
Rockwell Hardness	B75	RC33	RC29	RC42
Tensile Modulus of Elasticity	25 x 10 <sup>6</sup> PSI	26.5 x 10 <sup>6</sup> PSI	25.5 x 10 <sup>6</sup> PSI	28 x 10 <sup>6</sup> PSI
Poisson's Ratio	0.33	-	-	-

NOMINAL COMPOSITION	
Nickel	42%
Chromium	5.3%
Titanium	2.4%
Aluminum	0.55%
Silicon	0.50%
Manganese	0.40%
Carbon	0.02%
Iron	Balance

\*The measured elongation will be less as thickness decreases to 0.004" and less.

<sup>1</sup> These values may be adjusted by control of process variables – consult HPM for desired values.

PHYSICAL PROPERTIES <sup>2</sup>	
Density (Heat Treated)	0.294 lbs/cu.in.
Melting Point (Approx.)	1455° C
Electrical Resistivity	102 Microhm · cm
Thermal Expansion Coefficient (-45°C to 65°C)	8.1 x 10 <sup>-6</sup> /°C
Thermal Conductivity @ R.T.	13.0W/m · K
Curie Temperature (Heat Treated)	193°C Approx.
Magnetic Attraction	Yes

<sup>2</sup> Typical values to guide alloy selection but are not a guarantee of minimum or maximum.

Disclaimer: The information contained within this data sheet is for guidance only and is not intended for warranty of individual application - express or implied.