Hamilton Precision Metals
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TECHNICAL DATA SHEET

PRECISION C

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 -50ºF to 150ºF.

NOMINAL COMPOSITION:

Nickel	42%	Silicon	.50%
Chromium	5.3%	Manganese	.40%
Titanium	2.4%	Carbon	.02%
Aluminum	.55%	Iron	Balance

TYPICAL MECHANICAL PROPERTIES:[1]

	Annealed	ANNEAL/HEAT TREAT 1250ºf / 3½ HRS	50% COLD ROLLED	50% C.R./HEAT TREAT 1200ºF / 2½ HRS
Ultimate Tensile Strength	95,000 PSI	170,000 PSI	140,000 PSI	200,000 PSI
Yield Strength (.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	$25x10^6$ PSI	$26.5x10^6$ PSI	$25.5x10^6$ PSI	$28x10^6$ PSI
Poisson's Ratio	0.33			

*The measured elongation will be less as thickness decreases to .004" and less.

[1] These values may be adjusted by control of process variables – consult HPM for desired values.

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PHYSICAL PROPERTIES:[2]

Density	-	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^{-6}/°C
Thermal Conductivity @ R.T.	-	13.0W/m· K
Curie Temperature (Heat Treated)	-	193ºC Approx.
Magnetic Attraction	-	Yes

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 .0005" to .040 and widths up to 8.0". The material conforms to ASM 5221 and UNS N09902.

[2] Typical values to guide alloy selection but are not a guarantee of minimum or maximum.