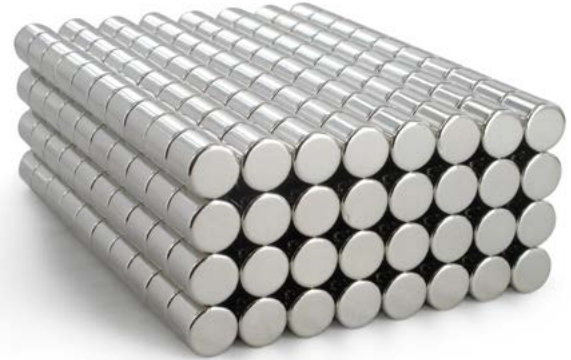


# Neodymium - 42

DATA SHEET

Property	Units	Typical Value
$B_r$ (Remanence)	mT	1280
	G	12800
$H_{cb}$ (Coercivity)	kA/m	923
	Oe	11600
$H_{cj}$ (Intrinsic Coercivity)	kA/m	1114
	Oersted	14000
$BH_{max}$ (Energy Product)	$\text{kJ/m}^3$	318
	MGOe	40




Property	Unit	Typical Value
Maximum Working Temperature*	°C	80
Temperature Coefficient of $B_r$ ( $\alpha$ )	%/°C	-0.12
Temperature Coefficient of $H_{ci}$ ( $\beta$ )	%/°C	-0.70
Curie Temperature	%/°C	310
Nom. Density	g/cc	7.5

\*Based on high working point

## Physical Properties

Property	Symbol	Unit	Typical Value
Vickers Hardness	D	D.P.N	570
Compression Strength	C.S.	N/mm <sup>2</sup>	780
Coefficient of Thermal Expansion	C//	10 <sup>-6</sup> /°C	3.4
	C⊥	10 <sup>-6</sup> /°C	-4.8
Electrical Resistivity	$\rho$	$\mu\Omega\cdot\text{cm}$	150
Temperature Coefficient of Resistivity	$\alpha$	10 <sup>-4</sup> /°C	2
Electrical Conductivity	$\sigma$	10 <sup>6</sup> S/m	0.667
Thermal Conductivity	k	kCal/(m.h.°C)	0.77
Specific Heat Capacity	c	kCal/(kg.°C)	0.12
Tensile Strength	<sup>o</sup> UTS or $S_u$	kg/mm <sup>2</sup>	8
Young's Modulus	$\lambda$ / E	10 <sup>11</sup> N/mm <sup>2</sup>	1.6
Flexural Strength	$\beta$	10 <sup>-12</sup> mm <sup>2</sup> /N	9.8
Compressibility	$\sigma$	10 <sup>-12</sup> mm <sup>2</sup> /N	9.8
Rigidity	E.I	N/mm <sup>2</sup>	0.64
Poisson's Ratio			0.24

**Relative Coating Performance – Nickel (Ni-Cu-Ni) is the standard**

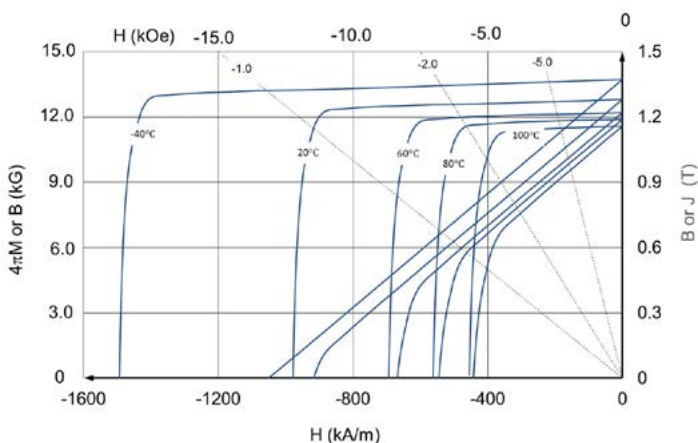
COATING APPLIED		NICKEL		EPOXY RESIN		Ni + EPOXY
		Electroless		Epoxy Spray Coating	E-coating	Nickel Plating + Epoxy E-Coating
Coating Thickness	Range (microns)	12 to 25	25 to 40	20 - 40	15 - 25	25 to 40
	Homogeneity	Excellent	Good		Excellent	Good
Effectiveness versus Magnet Size	Small (<20 grams)	Excellent	Good	Fair	Good	Good
	Large (>20 grams)	Fair to Good	Good	Fair	Good	Good
Hours before coating is likely to fail	Temp. & Humidity (60°C, 95%RH)	> 2500		>500	>1500	>2500
	Temp. & Humidity (85°C, 85%RH)	>500		<100	>300	>500
	Salt Spray (35°C, 5% NaCl)	>48		<24	>100	>200
Coating Colour		Silver	Silver	Black	Black	Black
Heat Cycle		Fair	Fair	Fair	Fair	Fair
Heat Resistance		Poor	Poor	Poor	Poor	Poor
Collision Test		Fair	Fair	Fair	Fair	Fair
Film to material adhesion test		Fair	Fair	Fair	Fair	Fair
Glue Adhesion Test		Fair	Fair	Fair	Fair	Fair
Tolerance Accuracy		Excellent	Excellent	Fair	Fair	Fair to Poor
Additional Remarks		15-30 microns N-Cu-Ni Standard coating		Epoxy Resins are not hematic		Thickness build up can be a problem

Gold plating is used in medicinal applications such as against the skin due to chemical inertness (typically 12micron thickness). Titanium coating (typically 2 microns thick) can also be used in medical applications.

**Corrosion Resistance Example Test Results**

COATING APPLIED	COLOUR	THICKNESS (microns)	CORROSION RESISTANCE RESULTS		
			96 hours Autoclave test	500 hours 85°C, 85%RH test	240 hours Salt Spray test
Electro-plated Nickel	Semi-bright silver	12.5 – 30	Pass	Pass	Failed after 48 hours
Zinc Chromate	Bright yellow iridescent	15 – 30	Pass	Pass	Pass
Phosphate passivation	Dull Black	25 – 40 mg/sq-ft	Failed after 24 hours	Failed after 24 hours	Failed after 24 hours

**Demagnetisation curve**



Demagnetisation curves represent typical properties that will vary due to product shape, size and density. Please contact the factory for information.