

Magneti in Neodimio (terre rare) art.337



Terre rare

I magneti in terre rare (Neodimio-Ferro-Boro) rappresentano quanto di più tecnologicamente avanzato il mercato possa oggi offrire.

Il Neodimio-Ferro-Boro sviluppa una potenza fino a 10 volte superiore rispetto ai tradizionali materiali magnetici. Sono pertanto oggi possibili soluzioni tecniche assolutamente impensabili sino a pochi anni fa.

Trattandosi di materiale soggetto a rapida corrosione, i magneti in Neodimio vengono normalmente protetti con rivestimenti in zinco o nichel (per maggiore chiarezza vedi tabella "rivestimenti protettivi").

I materiali standard sono consigliati per applicazioni con temperature massime di 80°C ma sono disponibili gradazioni resistenti fino a 180°C (Tipo M > a 100°C, Tipo H > a 120°C, Tipo SH > a 150°C, Tipo UH > a 160°C, Tipo EH > a 180°C).



Tierras raras

Los imanes de tierras raras (Neodimio-Hierro-Boro) representan lo más tecnológicamente avanzado que el mercado puede ofrecer hoy en día.

El Neodimio-Hierro-Boro desarrolla una potencia de hasta 10 veces superior con respecto a los materiales magnéticos tradicionales. Por lo tanto, hoy en día son posibles soluciones técnicas absolutamente impensables hasta hace pocos años.

Tratándose de material sujeto a rápida corrosión, los imanes de Neodimio normalmente se protegen con revestimientos de cinc o níquel (para más claridad ver tabla "revestimientos protectivos").

Los materiales estándar están aconsejados para aplicaciones con temperaturas máximas de 80°C pero están disponibles gradaciones resistentes hasta los 180°C (Tipo M > a 100°C, Tipo H > a 120°C, Tipo SH > a 150°C, Tipo UH > a 160°C, Tipo EH > a 180°C).



Terres rares

Les aimants en terres rares (Néodyme-Fer-Bore) sont ce que le marché offre aujourd'hui de plus technologiquement avancé.

Le Néodyme-Fer-Bore développe une puissance jusqu'à 10 fois supérieure par rapport aux matériaux magnétiques traditionnels. Il existe donc aujourd'hui des possibilités de solutions techniques impensables il y a encore quelques années.

Vu qu'il s'agit d'un matériau qui se corrompt facilement, les aimants en Néodyme sont habituellement protégés par des revêtements en zinc ou en nickel (pour plus de renseignements, voir le tableau "revêtements de protection"). Les matériaux standard sont conseillés pour les applications aux températures maximales de 80°C, mais plusieurs degrés de résistance sont également disponibles jusqu'à 180°C (Type M > à 100°C, Type H > à 120°C, Type SH > à 150°C, Type UH > à 160°C, Type EH > à 180°C).



Rare earths

Magnets made of rare earths (Neodymium-Iron-Boron) represent the technologically most advanced products the market has to offer today. Neodymium-Iron-Boron generates power that is 10 times that of traditional magnetic materials. Technical solutions that were totally inconceivable until a few years ago are therefore possible today.

Being a material that quickly corrodes, neodymium magnets are normally protected with zinc or nickel coatings (for more details see the "protective coatings" table).

The standard materials are recommended for applications with maximum temperatures of 80°C. However, gradations that resist up to 180°C are available (Type M > 100°C, Type H > 120°C, Type SH > 150°C, Type UH > 160°C, Type EH > 180°C).



Seltene Erden

Die Magnete aus Seltenen Erden (NdFeB) sind die technologisch fortschrittlichsten Magnete, die derzeit auf dem Markt erhältlich sind. Der Hochleistungs-Magnetwerkstoff NdFeB (Neodym-Eisen-Bor) übertrifft von der Leistung her bis zu 10 Mal die herkömmlichen Magnetwerkstoffe und erschliesst damit technologische Anwendungen, die bis vor einigen Jahren noch absolut undenkbar waren.

Die Werkstoffe der Neodym-Magneten unterliegen sehr stark der Korrosion und werden deshalb in der Regel durch Zink- oder Nickelbeschichtungen geschützt (nähere Informationen hierzu können der Tabelle "Schutzbeschichtungen" entnommen werden).

Die Standardmaterialien eignen sich für Anwendungen bei Temperaturen bis max. 80°C, es sind aber auch Ausführungen mit höherer Temperaturbeständigkeit bis 180°C erhältlich (Typo M > bis 100°C, Typo H > bis 120°C, Typo SH > bis 150°C, Typo UH > bis 160°C, Typo EH > bis 180°C).

Proprietà fisiche a temperatura ambiente

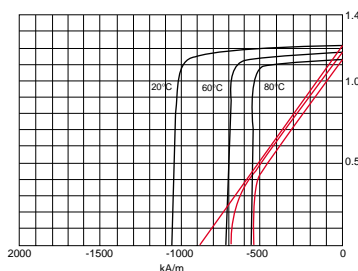
Propiedades físicas a temperatura ambiente

Propriétés physiques à température ambiente

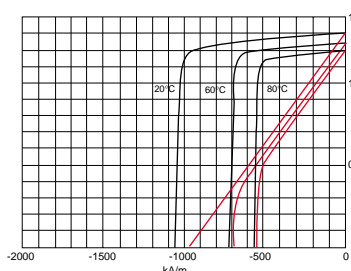
Physical properties at room temperature

Physikalische Eigenschaften bei Raumtemperatur

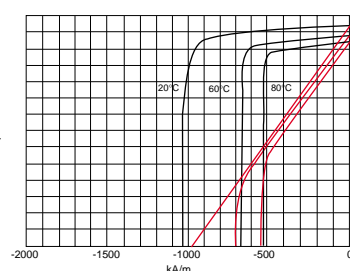
Temp. Coeff. of Br: Coefficiente di temp. di Br	-0.11% °C (20-100°C)	Temp. Coeff. of HcJ: Coefficiente di temp. di HcJ:	-0.60% °C (20-100°C)
Density: Densità:	7.4-7.6 g/cm ³	Electrical resistivity: Resistività elettrica:	144 μ Ω .cm
Vickers Hardness: Durezza	570 Hv	Flexural Strength: Resistenza alla flessione	25 kg/mm
Tensile strength: Resistenza alla trazione:	8.0 Kg/mm ²	Coeff. of Thermal Expansion: Coefficiente di espansione termica	4 x 10
Specific Heat: Calore specifico:	0.12 kCal/(Kg.°C)	Thermal Conductivity: Conducibilità Termica:	7.7 Kcal/(m.h.°C)
Young's Modulus: Modulo di Young	1.6 x 10 ¹¹ N/m ²	Rigidity: Rigidità:	0.64 N/m ²
Poisson's Ratio: Coefficienti di Poisson's	0.24	Compressibility: Compressibilità:	9.8 x 10 ⁻¹² m ² /N
Curie Temperature: Temperatura di Curie	310-340°C		



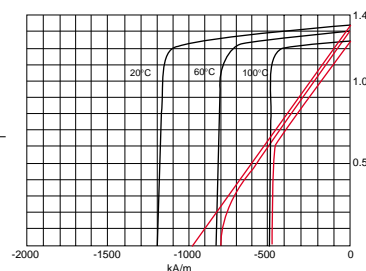
NEO 35



NEO 40

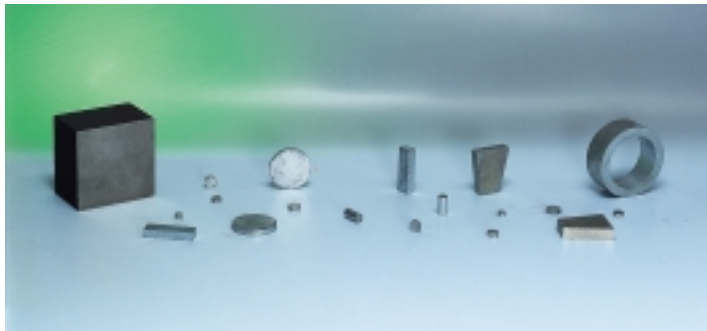
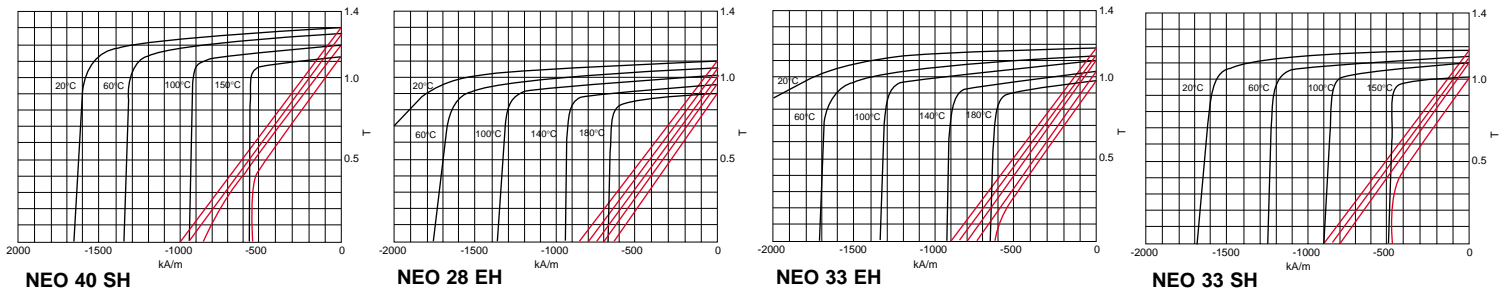
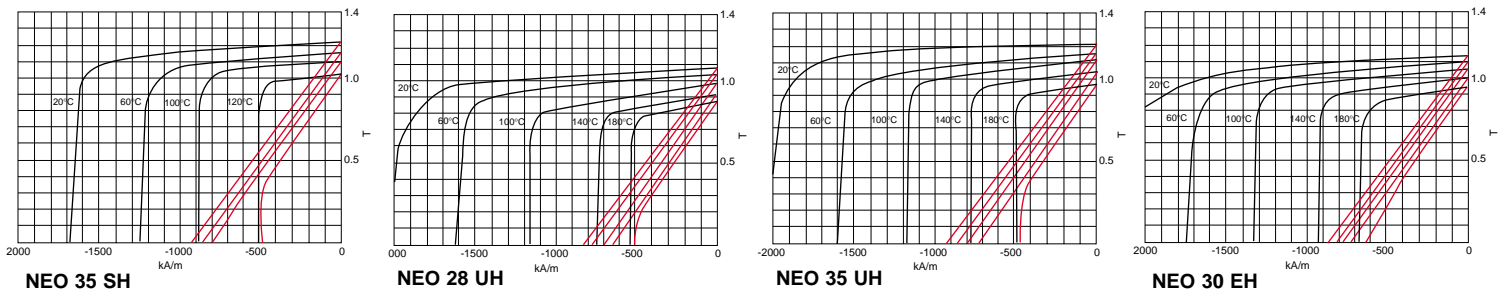
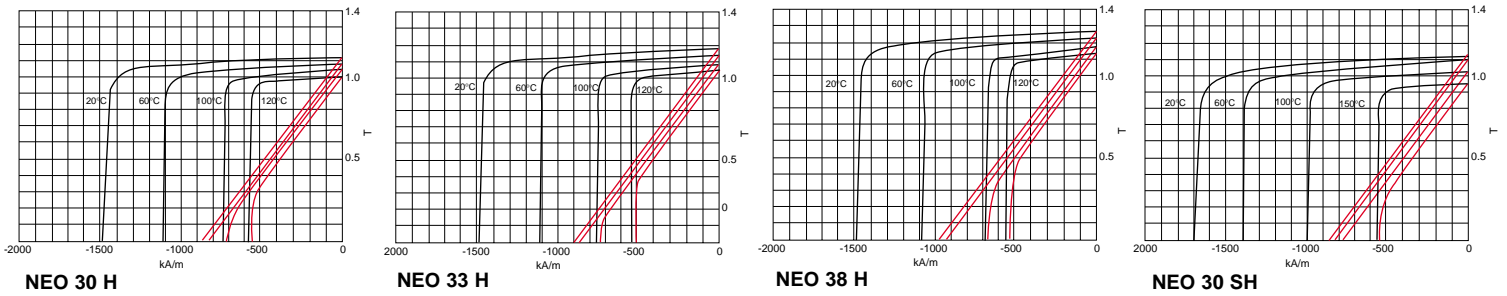


NEO 48



NEO 42 M

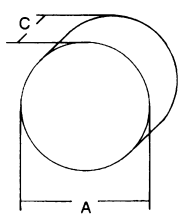
Cicli di Isteresi dei Magneti in Neodimio



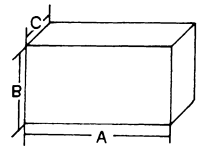
Tipici magneti in Neodimio
 Típicos imanes en Neodimio
 Aimants typiques en Néodyme
 Typical magnets made of Neodymium
 Typische Magnete aus Neodym

Rivestimenti	Revestimientos	Revêtements	Coatings	Beschichtungen
Surface treatment Trattamento Superficiale	Type Tipo	Thickness of layer Spessore dello strato	Surface color Colore superficiale	Notes Note
Passivazione/Passivation		$\leq 1 \mu$	Silver-gray/Grigio Argentato	Temporary protection/Protezione temporanea
Copertura Nickel/Nickel coating	Ni + Ni Ni + Cu + Ni	10 - 20 μ	Glossy silver/Argento Lucido	Excellent resistance to humid atmospheres Eccellente resistenza all'atmosfera umida Very good resistance to humid atmospheres Ottima resistenza all'atmosfera umida
Copertura Zinco/Zinc coating	Zn C - Zn	8 - 20 μ	Glossy white/Bianco Lucido Bright color/Colore Brillante	Good resistance to saline steam Buona resistenza alle vaporazioni saline Excellent resistance to saline steam Eccellente resistenza alle vaporizzazioni saline
Copertura Stagno/Tin coating	Ni + Cu + Sn	15 - 20 μ	Glossy silver/Argento Lucido	Superior resistance to humid atmospheres Resistenza superiore all'atmosfera umida
Copertura Aurea/Gold coating	Ni + Cu + Au	15 - 20 μ	Bright gold/Oro Brillante	Superior resistance to humid atmospheres Resistenza superiore all'atmosfera umida
Copertura Rame/Copper coating	Ni + Cu	10 - 20 μ	Bright gold/Oro Brillante	Temporary protection/Protezione temporanea
Epossidica/Epoxy	Ni + Cu + Epoxy	15 - 25 μ	Black/Nero	Excellent resistance to saline steam Eccellente resistenza alle vaporizzazioni saline
Copertura Chimica/Chemical coating	Ni + Epoxy	15 - 20 μ	Glossy silver/Argento Lucido	Excellent resistance to humid atmospheres Eccellente resistenza all'atmosfera umida

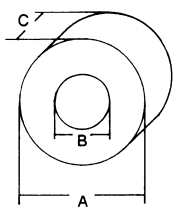
Neodimio



A mm	C mm	C mm	C mm
1,2	2	6	
1,5	2	3	4
2	2	3	4
2	5	6	11
2	15	20	25
3	1,5	2	6/27
4	1,5	2	3
4	4	5	6
4	7	10	27
4,5	3,5	19	
5	1	1,5	2
5	3	4	5
5	6	8	10
5	15	20	24
6	1,5	2	3
6	3,6	4	4,5
6,5	2		
7	3	5	
7,5	2		
8	1,5	2	3
8	3,6	4	5
8	6	7,5	10/16
9,5	1	1,5	2
9,5	4	5	
10	1,5	2	3
10	5	10	40
12	2	3	4
12	5	10	
12,5	1,5	2	
13	10	20	
14	2	3	4
18	2	5	10
20	2	5	
22	10		
22,5	10		
23	3		
24,5	3,5		
25	5	10	
28,5	10		
30	5		
38	5		



A mm	B mm	C mm
1,5	2	3
4	4	5
8	4	2
8,9	4,95	3,45
10	3	10
12	4	2
13	5	2
13	8	3
15	15	5
16	12	9
18	12	2
20	4	1,5
20	10	2
20	10	5
20	20	5
25	17	6
26	8	2
30	10	6
35	14	12
40	8	2
40	20	5
45	10	10
50	14	10
50	40	10
50	40	20
50	50	25
56	13	6
60	20	10
75	50	20
150	100	10
150	100	20
150	100	25



A mm	B mm	C mm
6	1,5	2
10	3,5	5
13	5	2
14	3,1	4
15,5	7	2
19,5	12,6	5
20	3	3
22	6,2	10
34	20	7,4
36	18	7,5
40	22,8	6
50	25	6
70	30	5
70	30	10

Dimensioni minime e massime realizzabili rispetto all'asse di magnetizzazione

Dimensiones mínimas y máximas realizables con respecto al eje de magnetización

Dimensions minimales et maximales réalisables par rapport à l'axe d'aimantation

Minimum and maximum dimensions that may be created as regards the magnetization axis

Herstellbare Mindestgrößen und maximale Größen bezogen auf die Magnetisierungsachse

	Min Spessore Thickne	Max Spessore Thickne	Min Ø int	Max Ø ext	Min Ø int	Max Ø ext	Min Lunghezza Lenght	Max Lunghezza Lenght	Min Larghezza Width	Max Larghezza Width
Axial Neo Anello/Ring	0.5	50	1	130	3	150				
Diametral Neo Anello/Ring	0.5	50	1	45	3	50				
Radial Neo Anello/Ring										
Axial Neo Disco/Disc	0.5	50			2	150				
Diametral Neo Disco/Disc	0.5	50			2	50				
Axial Neo Blocco/Block	0.5	50					1	150	1	150

Tolleranze dimensionali standard $\pm 0,1$ su tutte le quote. Su richiesta si possono garantire tolleranze centesimali

Tolerancias dimensionales estándar $\pm 0,1$ sobre todas las cotas. Bajo petición se pueden garantizar tolerancias centesimales

Tolérances dimensionnelles standard $\pm 0,1$ pour toutes les mesures. Sur demande, nous pouvons garantir des tolérances centésimales.

Standard ± 0.1 dimensional tolerances for all dimensions. Upon request, centesimal tolerances may be guaranteed.

Standardabweichungen auf alle Maßangaben $\pm 0,1$. Auf Wunsch können Hundertstelabweichungen garantiert werden.

Material	Induzione residua Br Remanence Br				Forza coercitiva HcB Coercivity HcB				Forza coercitiva HcJ Intrinsic Coercivity HcJ		Prodotto massiam energia Max Energy Product				Temp.Max di lavoro Max. Working Temp.
	kGs		T		kOe		kA/m		kOe	kA/m	MGOe		kJ/m³		°C(L/D=0.7)
	Typ.	Min	Typ.	Min	Typ.	Min	Typ.	Min	Min	Min	Typ.	Min	Typ.	Min	Max
NEO 35	12.2	11.7	1.22	1.17	11.2	10.5	891	836	12	955	35	33	279	263	80
NEO 38	12.6	12.2	1.26	1.22	11.2	10.5	891	836	12	955	38	35	302	279	80
NEO 40	13.0	12.6	1.30	1.26	11.2	10.5	891	836	12	955	40	38	318	302	80
NEO 42	13.3	13.0	1.33	1.30	11.2	10.5	891	836	12	955	42	40	334	318	80
NEO 45	13.7	13.3	1.37	1.33	11.2	10.5	891	836	12	955	45	42	358	334	80
NEO 48	14.1	13.7	1.41	1.37	10.8	10.5	859	812	11	875	48	45	382	358	80
MEO 50	14.4	14.0	1.44	1.40	10.8	10.2	859	811	11	875	50	48	399	383	70
NEO 33 M	11.7	11.4	1.17	1.14	10.8	10.2	859	812	14	1114	33	30	263	239	100
NEO 35 M	12.2	11.7	1.22	1.17	11.2	10.5	891	836	14	1114	35	33	279	263	100
NEO 38 M	12.6	12.2	1.26	1.22	11.5	10.8	915	859	14	1114	38	35	302	279	100
NEO 40 M	13.0	12.6	1.30	1.26	11.5	10.8	915	859	14	1114	40	38	318	302	100
NEO 42 M	13.3	13.0	1.33	1.30	11.5	10.8	915	859	14	1114	42	40	334	318	100
NEO 45 M	13.7	13.3	1.37	1.33	11.5	10.8	915	859	14	1114	45	42	358	334	100
NEO 48 M	14.1	13.7	1.41	1.37	11.5	10.8	915	859	14	1114	48	45	383	359	90
NEO 30 H	11.4	10.8	1.14	1.08	10.2	9.8	812	780	17	1353	30	28	239	223	120
NEO 33 H	11.7	11.4	1.17	1.14	11.2	10.2	875	812	17	1353	33	30	263	239	120
NEO 35 H	12.2	11.7	1.22	1.17	11.2	10.5	891	836	17	1353	35	33	279	263	120
NEO 38 H	12.6	12.2	1.26	1.22	11.5	10.8	915	859	17	1353	38	35	302	279	120
NEO 40 H	13.0	12.6	1.30	1.26	11.5	10.8	915	859	17	1353	40	38	318	302	120
NEO 42 H	13.3	13.0	1.33	1.30	11.5	10.8	915	859	17	1353	42	40	334	318	120
NEO 44 H	13.6	13.3	1.36	1.33	11.5	10.8	915	859	17	1353	44	42	350	334	120
NEO 46 H	13.8	13.5	1.38	1.35	11.5	10.8	915	859	17	1352	46	44	367	351	120
NEO 48 H	14.1	13.7	1.41	1.37	11.5	10.8	915	859	17	1352	48	45	383	359	120
NEO 27 SH	10.6	10.2	1.06	1.02	10.5	9.6	836	764	20	1592	25	27	199	215	150
NEO 30 SH	11.4	10.8	1.14	1.08	10.2	9.8	812	780	20	1592	30	28	239	223	150
NEO 33 SH	11.7	11.4	1.17	1.14	11.0	10.2	875	812	20	1592	33	30	263	239	150
NEO 35 SH	12.2	11.7	1.22	1.17	11.2	10.5	891	836	20	1592	35	33	279	263	150
NEO 38 SH	12.6	12.2	1.26	1.22	11.5	10.8	915	859	20	1592	38	35	302	279	150
NEO 40 SH	13.0	12.6	1.30	1.26	11.5	10.8	915	859	20	1592	40	38	318	302	150
NEO 42 SH	13.3	13.0	1.33	1.30	11.5	10.8	915	859	20	1591	42	40	335	319	150
NEO 44 SH	13.6	13.3	1.36	1.33	11.5	10.8	915	589	20	1591	44	42	351	335	150
NEO 28 UH	10.8	10.4	1.08	1.04	10.2	9.8	812	780	25	1989	28	25	223	199	160
NEO 30 UH	11.4	10.8	1.14	1.08	10.6	10.0	844	796	25	1989	30	28	239	223	160
NEO 33 UH	11.7	11.4	1.17	1.14	11.0	10.2	875	812	25	1989	33	30	263	239	160
NEO 35 UH	12.2	11.7	1.22	1.17	11.2	10.5	891	836	25	1989	35	33	279	263	160
NEO 38 UH	12.6	12.2	1.26	1.22	11.5	10.5	915	835	25	1989	38	35	303	279	160
NEO 40 UH	13.0	12.6	1.30	1.26	11.5	10.5	915	835	25	1989	40	38	319	303	160
NEO 28 EH	10.8	10.4	1.08	1.04	10.2	9.8	812	780	30	2387	28	25	223	199	180
NEO 30 EH	11.4	10.8	1.14	1.08	10.6	10.0	844	796	30	2387	30	28	239	223	180
NEO 33 EH	11.7	11.4	1.17	1.14	11.0	10.2	875	812	30	2387	33	30	263	239	180
NEO 35 EH	12.2	11.7	1.22	1.17	11.5	10.5	915	835	30	2387	35	33	279	263	180
NEO 38 EH	12.6	12.2	1.26	1.22	11.5	10.5	915	835	30	2387	38	35	303	279	180



Tipici magneti in Neodimio
 Típicos imanes de neodimio
 Aimants typiques en neodymium
 Typical neodymium magnets
 Typische Neodym-Magnete