

MAGNEDUR® 20-4

Type analysis

Single figures are nominal except where noted.

Iron	Balance	Nickel	20.00 %	Molybdenum	4.00 %
Manganese	0.30 %	Silicon	0.20 %	Carbon	0.010 %

Forms manufactured

Strip	Wire
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Description

MagneDur 20-4 is a cobalt-free alloy with semihard magnetic properties. It is malleable and ductile, lending itself to the manufacture of strip, foil, and wire.

MagneDur 20-4 has been used in theft detection tags. This alloy could also be considered for applications in instruments and hysteresis motors.

Key Properties:

- Cobalt-free
- Semi-hard magnetic properties
- Malleable and ductile

Markets:

- Consumer
- Industrial

Applications:

- Theft detection tags
- Instruments
- Hysteresis motors

> MAGNEDUR 20-4

Physical properties

PROPERTY	At or From	English Units
SPECIFIC GRAVITY	—	8.07
DENSITY	—	0.2920 lb/in ³
MEAN CTE	77 to 212°F	7.22×10^{-6} in/in/°F
	77 to 572°F	7.78×10^{-6} in/in/°F
	77 to 932°F	7.78×10^{-6} in/in/°F
ELECTRICAL RESISTIVITY	73°F	312.9 ohm-cir-mil/ft

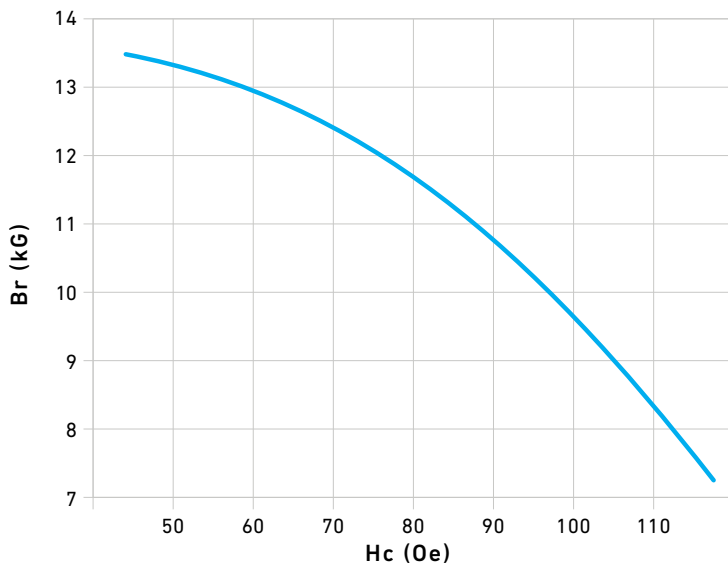
Typical magnetic properties

The strength of MagneDur 20-4 depends on the processing. Yield strength can range from 100 to 225 kpsi (689 to 1550 MPa) and ultimate strength from 180 to 250 kpsi (1240 to 1723 MPa). The alloy is reasonably tough and workable in all conditions.

The curve displayed in the [hyperlink entitled "Typical DC Magnetic Properties"](#) shows combinations of remanence (Br) and coercivity (Hc) that can be achieved in the rolling direction by varying the processing of MagneDur 20-4. Typical energy products are near 0.3 MGOe. Hc, Br, and hysteresis loop squareness are significantly lower in the transverse direction. As Hc rises, the loops become rounder and the properties become less anisotropic.

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TYPICAL DC MAGNETIC PROPERTIES



Heat treatment

MagneDur 20-4 is usually produced to a magnetic property specification. Any heat treatment will change its properties. Customers considering heat treatment should contact Carpenter Electrification.

Workability

Ductility and a low work-hardening rate make MagneDur 20-4 easy to cut, shear, slit, blank, machine, or grind. Limited bending, drawing, coining, and stamping are possible but change the magnetic properties. Welding or hot working ruin the magnetic properties. Photoetching can be done with sodium persulfate or ammonium persulfate solutions.

**For additional information, please
contact your nearest sales office:**

electrification@cartech.com | 610 208 2000

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