



HYMU 800®

Applicable specifications: ASTM A753 Alloy 4

Type analysis

Single figures are nominal except where noted.

Nickel	80.00 %	Iron	Balance	Molybdenum	5.00 %
Manganese	0.50 %	Silicon	0.15 %	Carbon	0.01 %

Forms manufactured

Sheet

Strip

Description

HyMu 800 is a nickel-molybdenum-iron alloy capable of being heat treated to show very high initial permeabilities, maximum permeabilities, and AC core losses at low magnetic flux densities.

This alloy is produced in strip form at thicknesses less than 0.008 in. (0.02 mm). Cut lengths, heat treated to magnetic property requirements ready for photoetching, can be supplied. Coiled strip, suitable for blanking or forming, can also be produced.

Key Properties:

- Specific magnetic characteristics based on heat treatment selected
- Maximum permeability
- AC core losses at low magnetic flux densities

Markets:

- Aerospace
- Industrial
- Consumer

Applications:

- Toroids

> HYMU 800

Physical properties

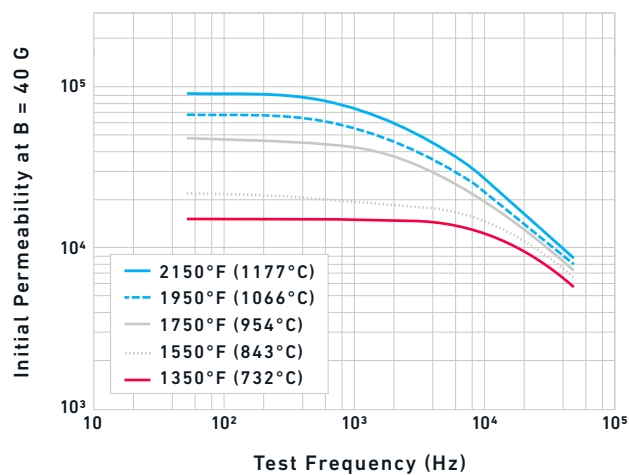
PROPERTY	At or From	English Units
SPECIFIC GRAVITY	—	8.74
DENSITY	—	0.3160 lb/in ³
MEAN SPECIFIC HEAT	—	0.1180 Btu/lb/°F
MEAN CTE	-90 to 400°F	7.20×10^{-6} in/in/°F
THERMAL CONDUCTIVITY	—	240.0 Btu-in/hr/ft ² /°F
ELECTRICAL RESISTIVITY	70°F	370 to 380 ohm-cir-mil/ft
TEMPERATURE COEFF OF ELECTRICAL RESIST	0 to 930°F	6.00×10^{-4} ohm/ohm/°F
CURIE TEMPERATURE	—	860°F
MELTING RANGE	—	2650°F

Magnetic properties

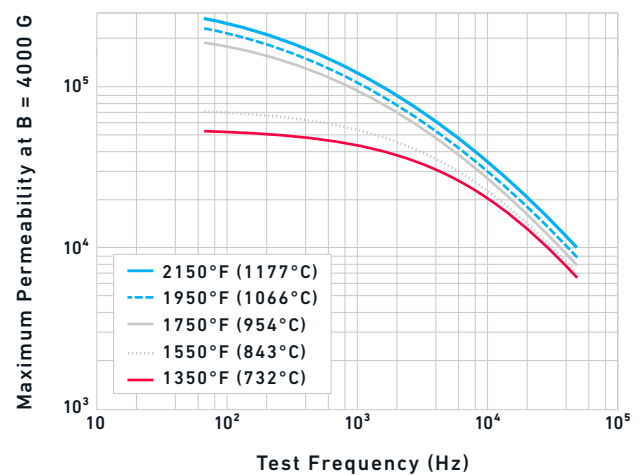
EFFECT OF ANNEALING TREATMENT ON MAGNETIC PERMEABILITY

0.002 in (0.051 mm) strip

INITIAL PERMEABILITY VS. TEST FREQUENCY



PERMEABILITY AT HIGH FLUX LEVELS VS. TEST FREQUENCY

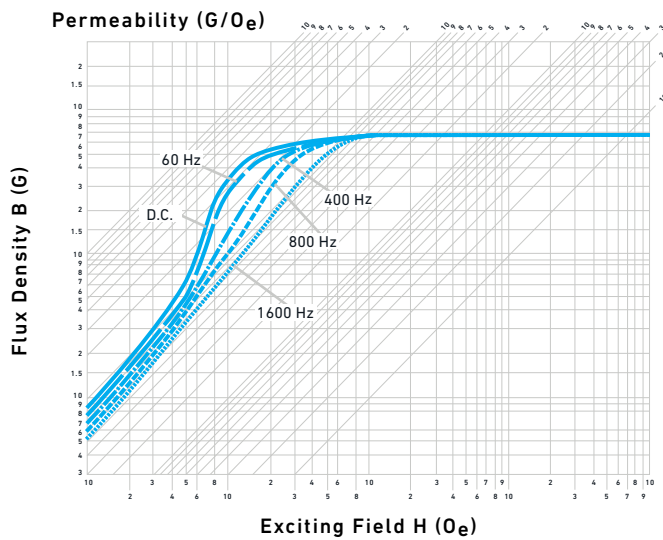


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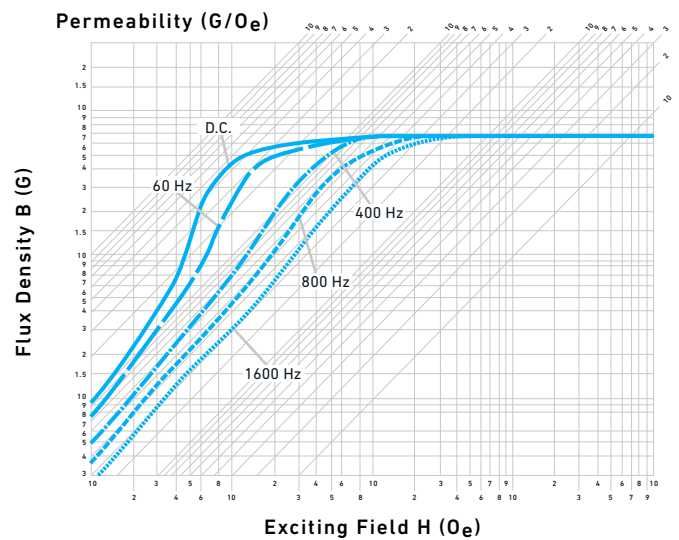
TYPICAL MAGNETIZATION CURVES

1.00 in (25.4 mm) ID x 1.25 in (31.8 mm) OD

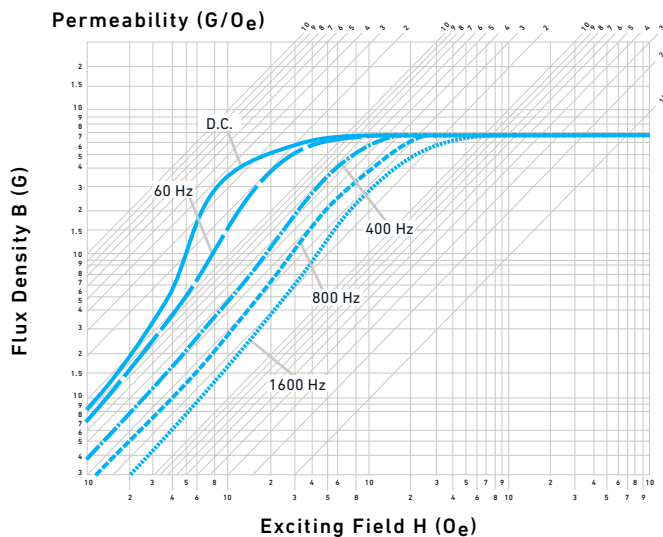
0.002 IN (0.051 MM) THICK TAPE TOROID



0.004 IN (0.10 MM) THICK TAPE TOROID



0.006 IN (0.15 MM) THICK TAPE TOROID



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Heat treatment

In-process anneal

In-process annealing for further cold rolling of strip products should consist of a strand annealing operation in a nonoxidizing, noncarburizing atmosphere (dry hydrogen or NH₃ preferred) at 1830/1920°F (1000/1050°C) that will produce a tensile strength of 100 ksi (690 MPa) maximum.

Thermal treatment for magnetic properties

Specific magnetic characteristics are obtainable through selection of the thermal treatment used: low temperatures 1350/1650°F (732/843°C) for very high frequency response, and high temperatures 2050/2150°F (1120/1177°C) for low frequency response.

HyMu 800 should be annealed in an oxygen-free, dry-hydrogen atmosphere with a dew point below -40°F (-40°C). For uniformity of properties, material should be held 2 to 4 hours at temperature and cooled at a rate of 300/600°F (167/333°C) per hour through the order-disorder range 1200/800°F (649/427°C).

Oil, grease, lacquer, and all other contaminants must be removed before annealing. The individual parts should be separated by an inert insulating powder such as magnesium or aluminum oxide during hydrogen annealing.

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

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