Nickel Irons and Soft Magnetics

Characterized by its relatively high permeability and low core losses, **nickel-iron alloys and soft magnetic materials** are used for efficient energy storage and transfer. Thin-rolled nickel-iron alloys from Arnold's PTM Division provide high saturation flux density making these materials optimally suited for high performance energy storage and transfer over low to middle frequencies.

Our precision rolled nickel-iron materials are used in devices such as transformer cores, toroids, sensors, motor laminations, watch springs, flapper valves, power springs, and various shielding applications.

Dimensional

Thickness	Maximum Width
0.01" - 0.0004" (0.254 - 0.0102mm)	12.5" (317.5mm) as-rolled edge 12.0" (304.8mm) with a slit edge
0.00039" - 0.00008" (0.0099 - 0.0020mm)	4.25" (107.95mm) as-rolled edge 4.00" (101.60mm) with a slit edge

Materials and Composition (wt %)

	Ni	Mo	Mn	Si	Fe	C	V	Nb	Co	Cr	Al	Ti
Moly Permalloy	80.0	4.8	0.5	0.35	Bal.	—	—	—	—	—	—	—
Supermendur	—	—	—	—	49.0	—	2.0	—	49.0	—	—	—
Permendur	—	—	—	—	49.0	—	2.0	—	49.0	—	—	—
Alloy 43	42.5	—	0.5	0.5	Bal.	0.03	—	—	—	5.25	0.5	2.5
Alloy 48	48.0	—	0.8	0.3	Bal.[1]	0.05	—	—	—	0.25	0.1	—
Alloy 49	48.0	—	0.5	0.35	51.0	0.02	—	—	—	—	—	—
Mu metal	79.0 - 80.6	3.8 - 5.0	0.95	0.42	Bal.[2]	0.03	—	—	—	—	—	—

[1] P 0.025 max; S 0.025 max [2] P 0.02max; S 0.008 max

Phosphorus & Sulfur contents are noted on these grades due to their detrimental effect to the material performance if they exceed the maximums.

Magnetic Properties

	Permeability at B = 20 Gauss	Maximum Permeability	Saturation Flux Density
Moly Permalloy	20,000	100,000	8,700
Mu metals	20,000	100,000	6,500
Supermendur	100,000	800,000	8,000
Permendur	800	5,000	24,500
Alloy 48	4,000	50,000	16,000
Alloy 49	4,000	50,000	16,000

TYPICAL APPLICATIONS

- Battery and energy storage
- Industrial machinery
- Motor and transformer devices
- Delivery systems for natural gas, oil and other energy resources

DELIVERY

Availability
Global.

Size
Available in thicknesses and widths per table.

Temper
Available in the annealed or as-rolled condition.

Surface
Clean uniform surface, 1Ra - 16Ra without discoloration or surface defects. Available with a slit edge (typical burr <10% of strip thickness) or with an as-rolled edge.

Packing
Properly packaged to avoid damage in transit. International packaging available upon request.

Conformance
ASTM B265, ASTM F67 (latest revision), DFARS Compliant.

MATERIALS CHARACTERISTICS

Please visit the PTM website for further details.

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