

# Leadership in Soft Magnetic Alloys



Carpenter Technology Corporation offers a wide selection of soft magnetic alloys to meet your material specifications.

Choose from high permeability alloys, shielding alloys, silicon core irons or high-flux-density cobalt-iron alloys that have been used in applications ranging from simple magnetic cores to the most complex electronic circuitry. All are produced to Carpenter's exacting standards of consistency for uniform magnetic response using premium-melting vacuum technologies.

Forms manufactured:

- Strip
- Plate
- Other forms available upon application
- Bar
- Wire

Carpenter's soft magnetic alloys provide mechanical properties matched to various methods of fabrication such as:

- Stamping
- Drawing
- Machining
- Cold forming
- Coining
- Etching
- Forging

Carpenter soft magnetic alloys have been used in the following applications:

- Motor laminations
- Magnetic amplifiers
- Magnetic bearings
- Magnetic shielding
- Forged electromagnetic components
- GFCI
- Relays
- Speedometers
- Transformers
- Vacuum equipment
- Watt-hour meters

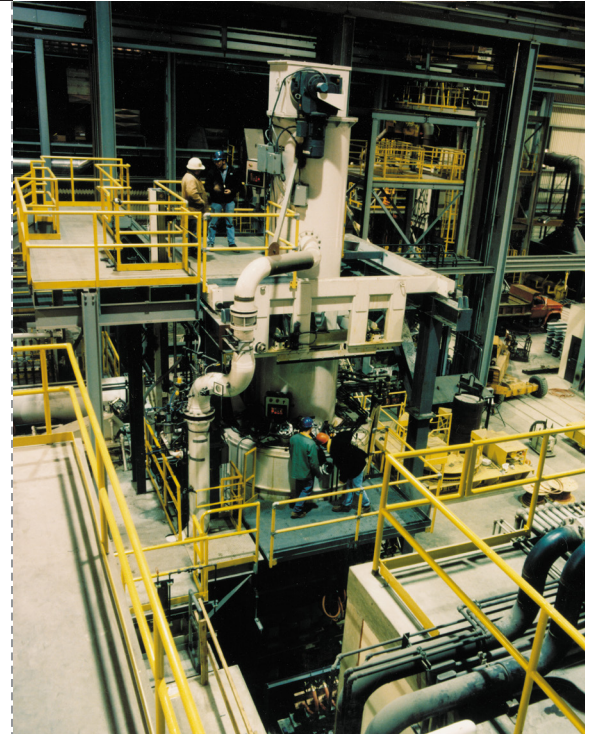
## World-Class Manufacturing and Quality Systems

Carpenter is a fully integrated manufacturer, using advanced equipment and technologies including vacuum induction melting, vacuum arc remelting, double-vacuum melting (VIM-VAR), in-line hot rolling, and modern cold finishing equipment. This combination of capabilities, coupled with a highly skilled work force, supports your requirements for consistent, quality material lot after lot.

## Technical Expertise

Bring us your design challenges. A team of metallurgists and product application experts stand ready to assist you with alloy selection and technical support.

Visit us at [www.cartech.com](http://www.carttech.com)



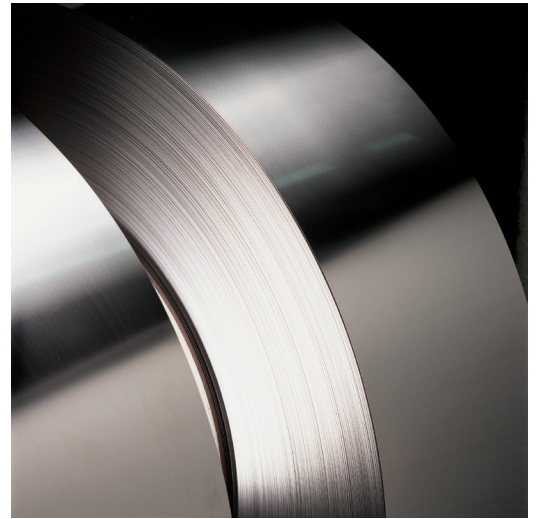
Carpenter Technology Corp. is a world recognized developer and manufacturer of cast wrought and powder metallurgy specialty alloys including stainless steels, high-strength alloys, superalloys, and tool and die steels as well as titanium alloys.

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## Selecting Carpenter Soft Magnetic Alloys

The matrix below compares various classes or “families” of soft magnetic alloys in terms of their relative performance characteristics and costs. It can serve as an initial guide for you in selecting which family of alloys to explore for an application.

	SENSITIVITY (permeability)	STRENGTH (flux density)	COST
HIGHEST	Nickel-Iron	Iron-Cobalt	Iron-Cobalt
	Silicon Iron	Iron	Nickel-Iron
LOWEST	Iron	Silicon Iron	Ferritic Stainless
	Iron-Cobalt	Ferritic Stainless	Silicon Iron
	Ferritic Stainless	Nickel-Iron	Iron



## Carpenter Soft Magnetic Alloy Type Analyses

Single figures are nominal.

Alloys	Carbon	Cobalt	Manganese	Nickel	Silicon	Iron	Other
Hiperco® 50 Alloy	0.01	48.75	0.05		0.05	Balance	V 1.90
Hiperco 50A Alloy		48.75	0.05		0.05	Balance	V 2.00
Hiperco 50HS Alloy	0.01	48.75	0.05		0.05	Balance	V 1.90
Hiperco 27 Alloy	0.01	27.00	0.25	0.60	0.25	Balance	Cr .60
Hiperco 15 Alloy	0.01	15.00	2.70	0.10	0.30	Balance	Cr .60
Carpenter High Permeability "49"® Alloy/Hy Ra 49	0.02		0.50	48.00	0.35	Balance	
Carpenter HyMu "80"® Alloy	0.02		0.50	80.00	0.35	Balance	Mo 4.2
Carpenter HyMu "800"	0.01		0.50	80.00	0.15	Balance	Mo 5.0
Carpenter Silicon Core Iron "A"	0.03		0.15		1.00	Balance	
Carpenter Silicon Core Iron "A-FM"	0.04		0.15		1.00	Balance	P 0.18
Carpenter Silicon Core Iron "B"	0.03		0.15		2.50	Balance	
Carpenter Silicon Core Iron "B-FM"	0.03		0.40		2.50	Balance	P 0.12
Carpenter Silicon Core Iron "C"	0.03		0.15		4.00	Balance	
Carpenter Electrical Iron	0.02		0.12	0.08	0.12	Balance	Cr 0.20 P 0.01 V 0.05

Detailed, searchable alloy data including an interactive Magnetic Property Selector are available in the Alloy TechZone™ at [www.carttech.com](http://www.carttech.com).

Visit us at [www.carttech.com](http://www.carttech.com)

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