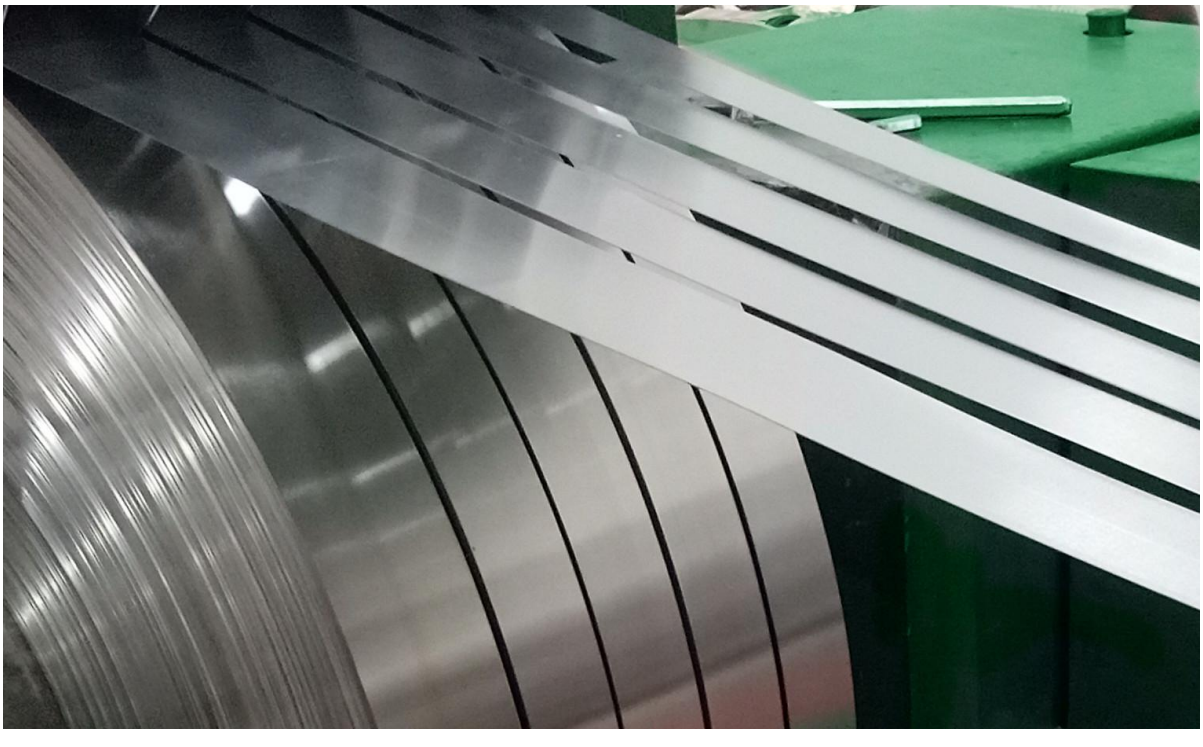
XAGY®

Xi'AN GANGYAN SPECILA ALLOY CO.,LTD.

Soft Magnetic Iron-Nickel Alloy High Permeability

Supermalloy



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INTRODUCTION

XI'AN GANGYAN SPECIAL ALLOY CORPORATION (XAGY), our factory specialized in manufacturing Nickel alloys & Cobalt alloys for 25^{+} years，with a company mission to provide a high quality, reliable source for precision alloys, high temperature alloys and stainless steels in both pilot processing and mass production. We are professionally manufacturing materials with unique features, which are then used in aerospace, military, electronics, marine, petroleum and petrochemical industries. Now our company has formally marketed in China's new stock market, stock No. 836660.

Base on "Quality-oriented, Leading Technology, Continuous Improvement, Customer Satisfaction", we believe XAGY Inc can be your best supplier.

TABLE 1 COMPOSITION & EXECUTIVE STANDARD

Material	Composition % by weight (Nominal Composition)			Standard
Supermalloy	Mo4.8-5.2	Ni79.0-81.0	Fe Remainder	GBn198-88

Equivalent to ASTM A753 Alloy type 4(Mo5),MIL-N-14411C Composition 5

KEY FEATURE

High Initial Permeability

Low Coercivity loss

Good formability and weldability

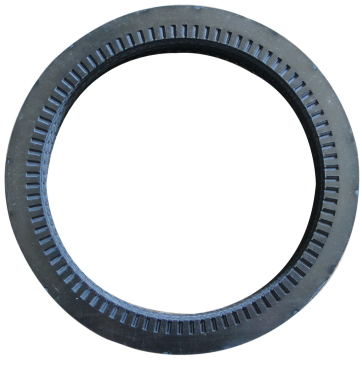
TABLE 2 PHYSICAL PROPERTIES

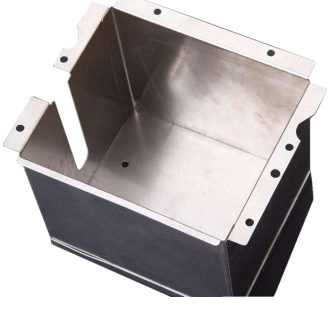
Material	Density,g/cm^3	Resistivity,μΩm	Curie Point,℃	High saturated magneto-striction coefficient 10^{-6}
Supermalloy	8.75	0.56	400	0.5

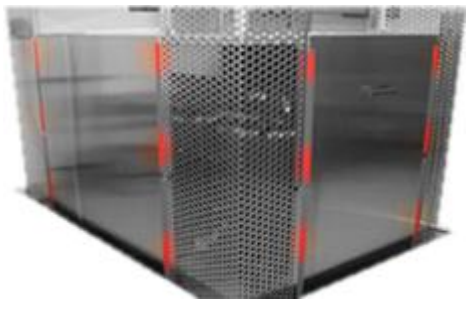
Temperature Range,℃	Thermal expansivity,x10^{-6}/K
20 to 100	11.5
20 to 200	...
20 to 300	...
20 to 400	...
20 to 500	14.0
20 to 600	...
20 to 700	...
20 to 800	...
20 to 900	...

TABLE 3 APPLICATION EXAMPLES

Material	Application Examples
Supermalloy	Manufacturing components for radio engineering, telephony, and telemechanics instruments.







Examples of Parts made from supermalloy ,stamped lamination assemblies for motors and generators,shielding box and shielding rooms.

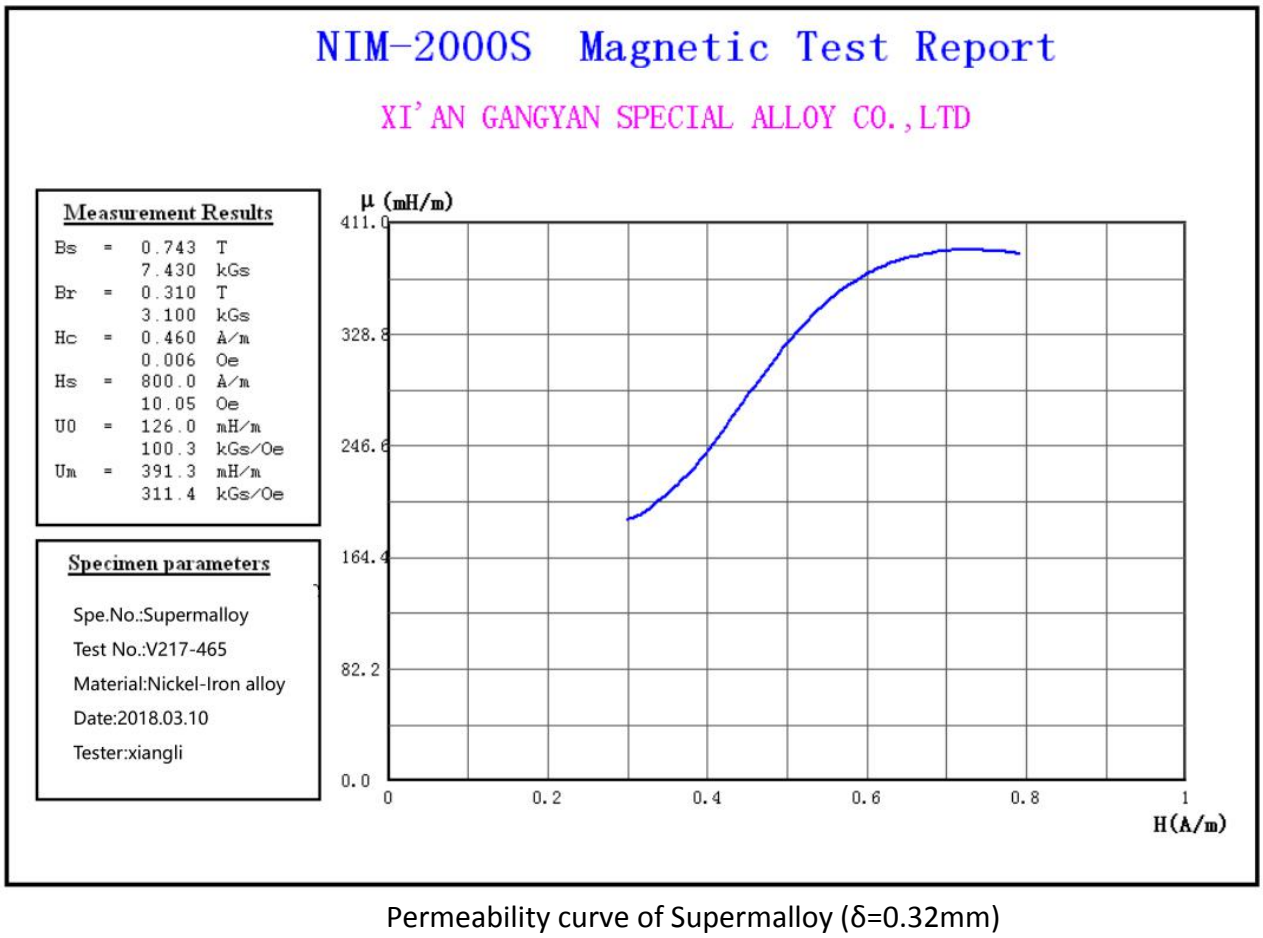
4.3 MAGNETIC PROPERTY

Material

Supermalloy

Thickness &Diameter/mm	$\mu_{0.08}$,≥ (mH/m)	μm,≥ (mH/m)	Bs,≥(T)	Hc.≤(A/m)
Grade A				
0.05 to 0.09	35.0	137.5	0.70	2.4
0.10 to 0.19	37.5	187.5	0.70	1.6
0.20 to 0.34	50.0	225.0	0.70	1.2
0.35 to 1.00	62.5	312.5	0.70	0.8
1.10 to 2.50	50.0	187.5	0.70	1.2
2.51 to 3.00	3.5	150.0	0.70	1.44
Grade B				
0.05 to 0.09	50.0	175.0	0.70	1.6
0.10 to 0.19	62.5	225.0	0.70	1.2
0.20 to 0.34	75.0	250.0	0.70	1.0
0.35	68.8	325.0	0.70	0.7
Forging (Bar)				
30 to 120	37.5	125.0	0.70	1.6

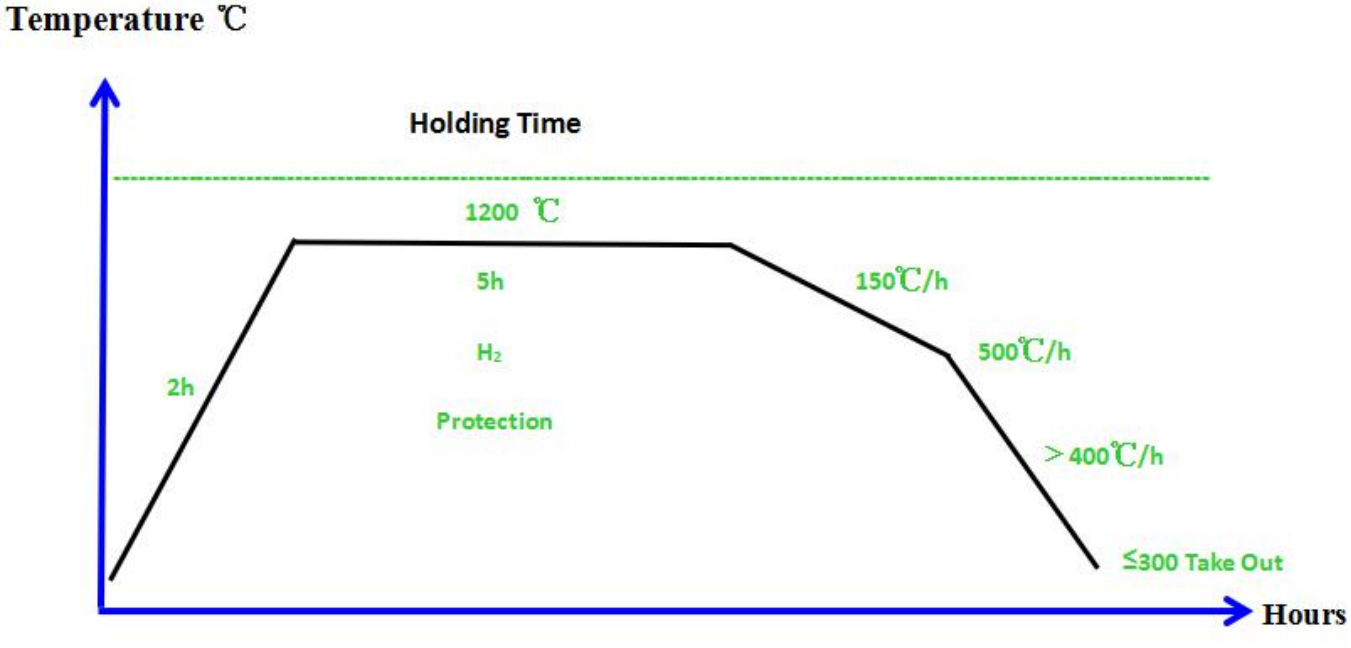
Permeability Curve



Permeability curve of Supermalloy (δ=0.32mm)

Further Process-(Heat Treatment)

Use a non-oxidizing atmosphere such as dry hydrogen,argon,or equivalent ,or a Vacuum. Appropriate safety precaution must be taken when working with highly flammable atmospheres.



Recommending Heat Treatment Method for Supermalloy ,Rod / plate / Strip (Components)

Annealing VS Heat-treatment

The definition of annealing is: “heat metal and allow it to cool slowly, in order to remove internal stresses and toughen or soften it.” While we need to anneal Them and other magnetic shielding alloys during the magnetic shield fabrication process, we do not anneal for maximum magnetic permeability. As noted in the definition, the annealing step is done to relieve stress within the material that was introduced as a part was being formed or bent.

When we are heat-treating our Supermalloy soft magnetic alloy, we are actually changing the physical properties by enlarging the grain structure, allowing for more magnetic flux to be absorbed by the magnetic shield.

In conclusion, both annealing and heat-treating are necessary during the magnetic shield fabrication process, but both serve a very different purpose. If you need to relieve stress in material, soften or toughen it, you want to anneal it. If you are trying to achieve maximum permeability, you want to heat treat the material.
It should also be noted that material in our kinds have been Non-annealed &annealed for forming, but is not heat-treated for maximum magnetic permeability.

Forms Of Supply

The soft magnetic alloy Supermalloy are available in many shapes and dimensions,supplying semi-finished products in forms of Strip,plate & Rods.
The following table provides an overview of the availability of our material in the various forms of supply.

Material	Rods	Strip	Plate
Supermalloy	√ Dia.20 to120(mm)	√ Thickness0.1 to 1.0(mm)	√ Thickness0.35 to 40.0(mm)

√=available

Delivery state “Annealed” possible for strip

Supermalloy with 80% of Nickel and 5% molybdenum are available in cold-rolled condition for strip.
Rod in hot rolling or forging condition,plate in hot rolled or Forging condition.

Chemical composition,Physical and Magnetic properties will be engineered according to specific customer requirements.Therefore chemical composition,physical and magnetic properties might be different to values listed in this document.

Information about product characteristics or applicability of materials are shown only for informative purposes.

If you still have questions about the material , do not hesitate to contact us at Supportsales@xagy.cn with any specific questions.