MAGNETICS®
A Division of Spang and Company

COMPONENTS DIVISION

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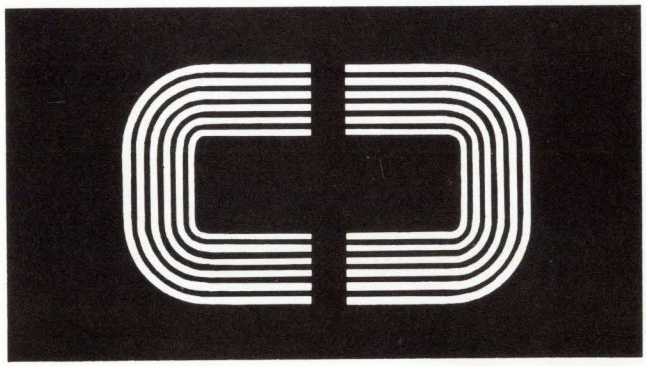
TECHNICAL BULLETIN

BULLETIN NO. MCC-100S2
Supersedes Bulletin MCC-100S1

CUT CORES* with METGLAS® Alloy Ribbon



Since the 1960 discovery of the existence of ferromagnetism in some amorphous materials, active R&D efforts in recent years have resulted in the development of practical magnetic glasses. Metallic glasses are generally produced by very rapid quenching in which a molten metal alloy is rapidly cooled (at rates on the order of 10^6 degrees/second) through the temperatures at which crystallization usually occurs. The basic difference between crystalline and glassy metals is in their molecular structures. Crystalline metals are composed of regular, 3 dimensional arrays of atoms which exhibit long-range order. Metallic glasses do not have long-range structural order; their atoms are packed in a random arrangement similar to that of liquid metal or ordinary glass. The intrinsic resistivity of the amorphous ribbon is about 2 to 4 times higher than that of conventional crystalline magnetic metals, which means that the eddy current effect is much reduced in the amorphous metals as compared with crystalline alloys. This makes the amorphous metals attractive for some high frequency applications.

The work of Allied Corporation in this field has led to their introduction of METGLAS alloys. The material is normally in the form of ribbon which is then wound into a strip-wound core. METGLAS alloys are inherently thin, about 1 mil, extremely hard, over C-80 Rockwell, but very soft magnetically.

METGLAS Alloy 2605SC provides an attractive high magnetic induction material for a wide variety of magnetic applications. In an uncut form, it is essentially a square loop material comparable to Orthonol® material. In cut form and appropriately annealed, this alloy yields a material with a rounded B-H loop and magnetic properties similar to the higher nickel contained alloys (80 Permalloys). Core losses are comparable to Supermalloy and ferrites at frequencies to 100 KHz (see reverse side). The special advantage of high induction (about 2 times the 80 Permalloys) makes the alloy very attractive in high frequency magnetic core devices where ruggedness and low weight are important.

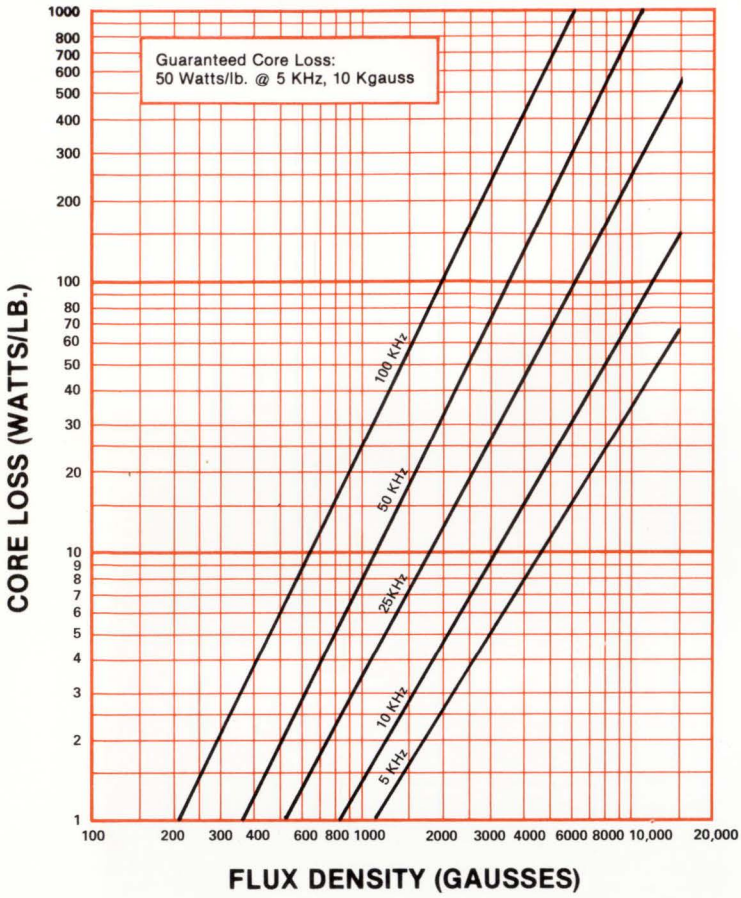
Cut "C" cores made with METGLAS 2605SC Alloy are available in a wide range of sizes as described in Magnetics Catalog MCC-100.

METGLAS® is Allied Corporation's registered trademark for amorphous alloys of metals.

ORTHONOL® is a registered trademark for MAGNETICS 50 Ni/50 Fe strip material.

*Patent Pending

Typical Core Loss Curves
MAGNETICS® Core MC8100-1B
(METGLAS 2605SC Material)



METGLAS Alloy 2605SC
Typical Properties*

MAGNETIC PROPERTIES (annealed)

Saturation Magnetization, B_S	16.1 KG
Coercive Force, H_C	0.04 Oe
Residual Induction, B_r	14.2 KG
Induction at 1 oersted	15.4 KG
Curie Temperature	370 °C

PHYSICAL PROPERTIES

Density	7.3 g/cm³
Stacking Factor	>.75
Continuous Service Temperature	– 50 °C to 125 °C
Crystallization Temperature	480 °C

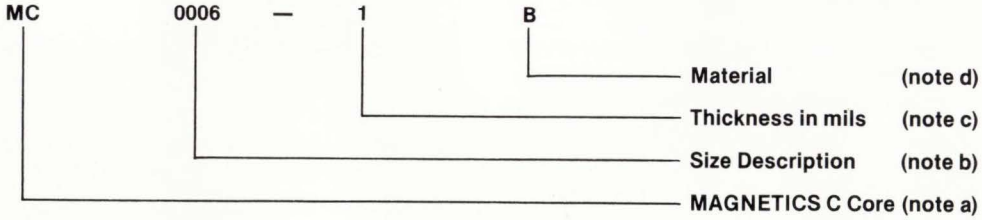
ELECTRICAL PROPERTIES

Resistivity	125 μ ohm-cm

*Measured on a toroid

How to order METGLAS Alloy 2605SC cut cores

Each core is coded by a part number that describes it in detail. Knowing the code will simplify purchasing. A typical number is:



(a) MC is used for cut C cores.
(b) The size code is the four digit number listed on pages 6 to 10, Magnetics catalog MCC-100.
(c) Material thickness (nominally 1 mil).
(d) The letter code for 2605SC material is "B".

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Also a producer of: • Tape, bobbin, powder cores • Laminations • Ferrites • Specialty metals • Engineered control systems