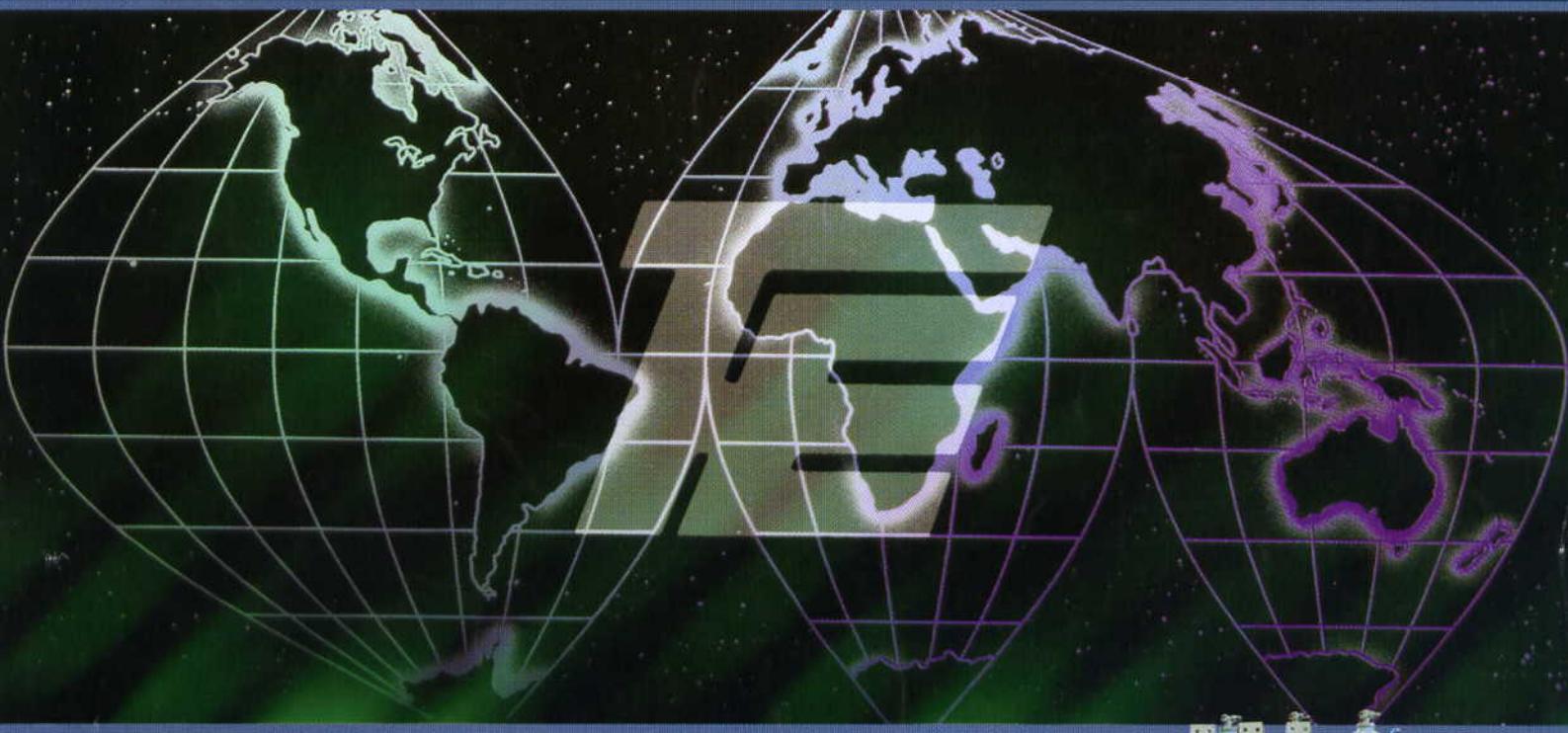
FORTUNE ELECTRIC



FORTGLAS®

AMORPHOUS METAL ALLOY COIL TRANSFORMERS

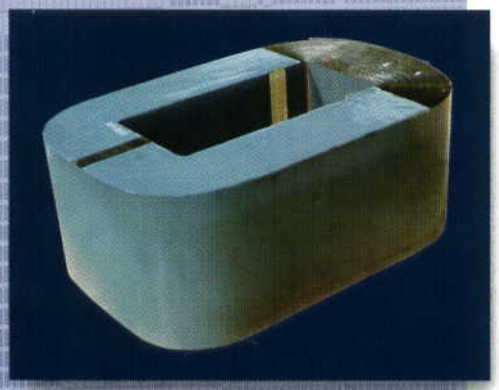
ISO 9001 REGISTERED

World Class Manufacturing Quality

10kVA - 500kVA, Single Phase

75 - 2,500 kVA, Three Phase

FORTGLAS® AMORPHOUS METAL ALLOY CORE TRANSFORMER

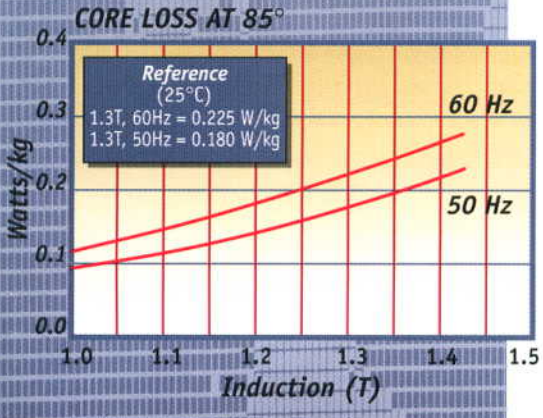


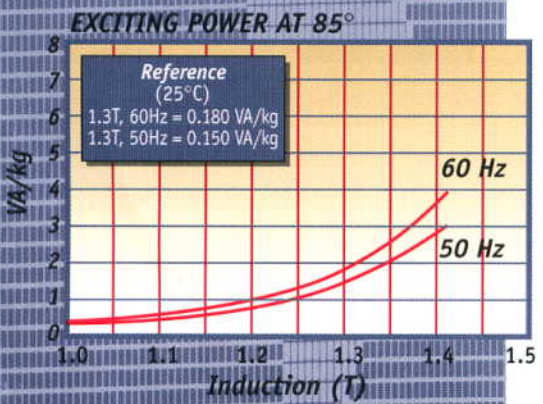
Amorphous metal alloy ribbon has been successfully implemented in the commercial wound core transformers, ranging from 10 kVA through 500 kVA single phase and 75 kVA through 2,500 kVA three phase. A significant energy savings through a 70% reduction of no load losses can be realized by using amorphous metal alloy ribbon in transformer cores.

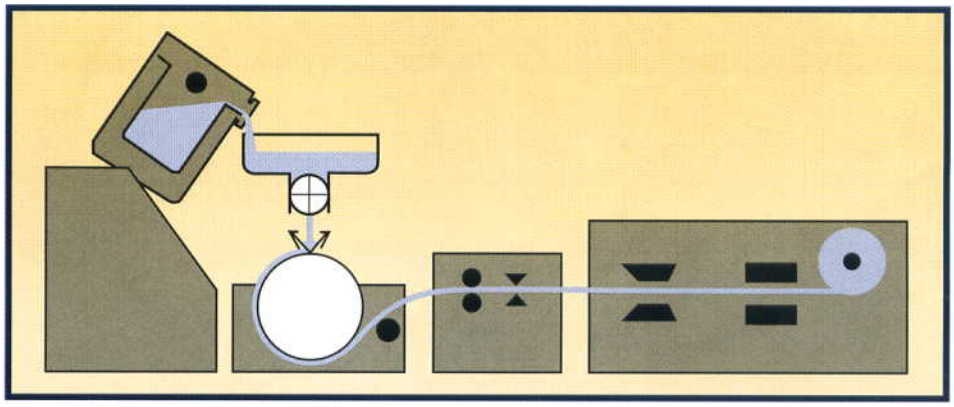
Fortune Electric has obtained the amorphous metal alloy core processing technology and the necessary manufacturing equipment for core processing through the license of AlliedSignal Inc. in the U.S.A. Today, we are a company not only capable of processing amorphous metal alloy cores, but also implementing the core into transformers. We are a supplier of amorphous metal alloy core transformers as well as a supplier of amorphous metal alloy cores.

Our amorphous metal alloy core transformers, which are registered as FORTGLAS® transformers, are certified as ISO 9001 by the British Standard Institution.

Typical Curves:







Introduction of Amorphous Metal Alloy Ribbon

In 1975, AlliedSignal Inc. developed the planar-flow casting method for processing amorphous metal alloy ribbon in a continuous length. In this proprietary manufacturing process, molten alloy is cooled at a rate of 1,000,000°C per second. This rapid solidification enables the finished alloy product to retain its amorphous atomic structure. The result is an ultra-thin ribbon with outstanding magnetic as well as physical properties.

Characteristics:

Superior magnetic properties are the most significant advantages for using amorphous metal alloy in transformers.

- High operating induction
- Low magnetic coercivity and high resistivity
- Low saturation induction
- Low core loss
- Thin, hard, brittle
- High tensile strength
- Flexible for core winding

FORTUNE ELECTRIC

FORTGLAS® *World-Class Quality and Performance*

Environmental Advantages

The advantages for using amorphous metal alloy ribbon and amorphous metal alloy core transformers are as follows:

- Reduces the energy required in ribbon processing.
- Greatly reduces the transformer core loss, minimizes the consumption of generated energy and generating cost.
- Minimizes the use of generating fuel, greatly reduces the carbon dioxide and acid gas, reduces the acid rain on the greenhouse effect on the earth's environmental contamination and damages, and creates a better future for the next generation.

Comparison of Amorphous Metal Alloy and Silicon Steel

Table 1 shows the comparison of amorphous metal alloy ribbon METGLAS® 2605S-2 to 0.23 mm thick high grain Oriented Silicon Steel. We can see that the no load loss of METGLAS® 2605S-2 is 66% less than that of Silicon Steel.

TABLE 1

	METGLAS® 2605S-2 (1)	Oriented Silicon Steel (2)	Ratio (1) / (2)
No Load Loss (W / Kg) at 1.4T	0.24	0.7	0.34
Exciting Power (VA / Kg) at 1.4T	0.45	0.8	0.56
Saturation Induction (T)	1.56	1.9	0.82
Thickness (mm)	0.03	0.23	0.13
Hardness (Hv)	900	188	4.8
Annealing Temperature (°C)	400	820	0.5
Magnetic Field (0_e)	10	-	-

Introduction of Amorphous Metal Alloy Core

Amorphous metal alloy ribbon is thin and brittle. Other than the general safety practice, the following cautions are to be followed:

- Wear safety glasses to prevent chips getting into eyes.
- Wear safety gloves to prevent moisture on the core from handling with bare hands and possible cuts to the hand from the thin ribbon.

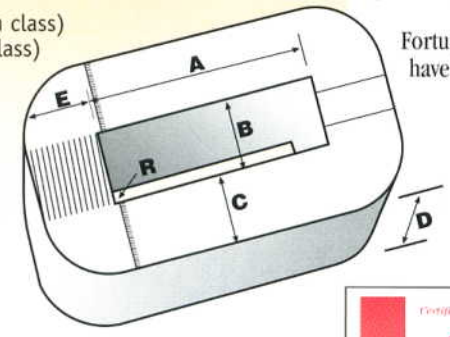
Specifications

Currently, the amorphous metal alloy ribbon widths are 142 mm, 170 mm, and 213 mm.

The amorphous metal alloy core dimensions are as follows:

Item	Ranges
A	180-600 mm (10 mm each class)
B	80-250 mm (5 mm each class)
C	≥ 25 mm
D	Ribbon Width +4 mm
E	C x 1.25
R	≥ 6.4 ± 1.5 mm
Weight	30 ~ 225 kg

For pricing, delivering and designing, cores are based on the above chart.



Packaging:

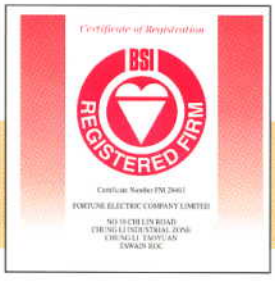
Proper packaging assures that no damage will occur during shipping and thus maintains its special characteristics.

- **Packed in styrofoam to absorb the external impact.**
- **A dry agent is packed inside the plastic bag to absorb moisture inside the bag and from outside.**

FORTGLAS® Transformers

Amorphous metal alloy cores are processed from ribbon to have a step-lap configuration at the loop joint. The assembled core is geometrically shaped into a rectangle and annealed for stress relief and magnetic directional order. Coils are designed to tight fit the core without the effects of electrical and magnetic characteristics to the unit. Coils are looped through the opening core joint and set onto the core legs to complete the core/coil assembly. Both cores and coils are mechanically designed and built to resist the short circuit forces and any possible external impact. The core is physically encapsulated to prevent the possibility of chips or broken metals falling into coils.

Fortune Electric's single phase and three phase FORTGLAS® transformers have been exported to the Japanese areas and were highly received in quality.



ISO 9001 CERTIFIED

BSI QUALITY ASSURANCE

NATIONAL ACCREDIATION OF CERTIFICATATION BODIES

FORTGLAS® AMORPHOUS METAL ALLOY CORE TRANSFORMER

Testing

Prior to assembling the core and coil, each core is tested for core losses. Each completely assembled FORTGLAS® transformer is tested for: 1) voltage ratio and polarity, 2) induced voltage, 3) voltage resistance of insulation, 4) no load loss, 5) load loss, 6) resistance, and 7) induced current. The tests assure that the quality meets the customer's requirements.

Table 2 shows tabulated losses of Single Phase and Three Phase FORTGLAS® Amorphous Metal Alloy Core Transformers which were designed to meet the customer's requirements.

TABLE 2
Losses of Single Phase and Three Phase FORTGLAS® Transformers

KVA	No Load Loss (W)	Load Loss (W)	% Exc. Curr.	Eff (%) 100% Load	Impedance Volt (%)	Core Wt. Kg
At 50 Hz.						
Single Phase						
200	84	1741	0.23	99.10	2.08	405
300	112	2655	0.24	99.09	2.46	545
500	157	4717	0.51	99.03	3.10	710
3 Phase						
200	113	1950	0.31	98.98	3.62	510
300	129	2636	0.30	99.00	4.68	610
500	183	4600	0.28	99.05	4.86	820
At 60 Hz.						
Single Phase						
10	13	116	0.55	98.73	2.17	48
25	24	235	0.38	98.97	2.10	80
50	39	429	0.59	99.07	2.23	139
3 Phase						
150	69	1623	0.08	98.88	4.35	345
420	185	3968	0.11	99.02	5.34	650
1000	359	8951	0.29	99.08	4.98	1200

For further information, contact either Fortune Electric Co. in Taiwan or U.S.A. Furnish phase, frequency, KVA, primary and secondary voltages, voltage tap, impedance, and IEC or ANSI standard for your transformers.

***FORTCAST®** Cast Coil Transformers*

Large Power Transformers

Pole/Platform Mount Transformers

Small Power Transformers

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