



(Formerly Known As PME Transformers (India) Ltd.)

ENERGY EFFICIENT AMORPHOUS METAL DISTRIBUTION TRANSFORMERS



PME Power Solutions (India) Limited has license to manufacture Amorphous Metal Cores & Transformers with technology with Metglas, Inc, USA.

Tripartite agreement with PME, Hitachi Metals India & Metglas Inc, executed & currently valid until 2020 (extendable further).

Range upto 500 KVA 33 KV class distribution transformers.

AMORPHOUS METAL TRANSFORMERS CORE / DESIGN & CONSTRUCTION

- Standard ribbon width.
- Use of single grade core material.
- A sophisticated process of manufacture & transformer cores, right from automatic cutting line & stacking machine.
- The stack is up righted so that it is resting on edge.
- The under lap end is laced first, then the overlap.
- The outer lap made to match up & protective sheet is closed with tape to prevent joints from opening.
- Core is formed horizontally with respect to the joint window to establish the overlap pattern with the help of hydraulic jacks.
- The arrangement of amorphous core & final shape for use is shown in Picture.



COMPARISON OF KEY FEATURES – AMORPHOUS METAL AND CRGO STEEL TRANSFORMERS

Properties	Unit	Amorphous Metal Grade2605SA1	CRGO Steel – Grade M4 (Stacked Core)
Density	(g/cm ³)	7.19	7.65
Specific resistance		130.00	45.00
Saturation flux density	(tesla)	1.58	2.03
Typical core loss at 50 Hz	Watt/kg	0.22 @ 1.4 Tesla	0.89 @ 1.5 Tesla
Nominal Thickness	mm	0.025	0.27
Average space factor		0.86	0.97
Available form		Thin sheet / Ribbon	Sheet / Roll
Annealing Temperature	°C	~360	~800
Other process		Magnetic field annealing	
Core construction & assembly		Wound core construction with distributed lab joints, ready to use core	Assembly of sheared & cut laminations
Productivity		Relatively high with less wastage	Low
Core steel grades		Single grade of uniform quality	Multiple grades with varying quality
No load loss		Very low around 70% compared to conventional grade CRGO transformer	Relatively high
Coil winding		Concentric rectangular shaped coils for better space factor utilization	Concentric round shaped coils
Reparability		Yes	Yes

WINDING DESIGN AND MANUFACTURE

- HV Winding is of generally using round wire in rectangular shape & single coil construction. The windings are wound on, on automatic special machines having improved features to give best quality.
- LV winding is made with rectangular conductor & helical / spiral construction or foil type using special automatic machines.
- Core coil assembly is similar to conventional transformers except that core is unlaced in joint region & replaced by pushing core sides together while closing the joint region.
- Coil is supported by the end frame assembly.
- Core coil assembly is heated in oven and tanked & finally filled with oil, dried & tested for which the latest equipment's are available in this new plant.

AMORPHOUS METAL TRANSFORMERS BENEFITS

- Energy savings & comparison chart with conventional transformers & similar rating show that iron losses are 30% of the CRGO Transformers.
- Total owning cost (TOC) is reduced by improvement in environments € factor socials & economics costs of generation related to CO₂, SO₂, & other green house gases emissions.
- Improvement in 'H' factor dealing with really world power supply.
- Perform better in over excitation stage.

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