

# *Manufacturing*

*dry cast resin*

*transformers*

*& coils*



*Ecodesign* 

## PRODUCTION PROCESS OF DRY CAST RESIN TRANSFORMERS

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starts with the realization of the coils - an essential part of the transformer.

The low voltage windings are normally made of aluminum sheet, that in case there are short circuits is able to guarantee a better resistance to the electrodynamic stresses. Such windings ensure the perfect compatibility between the expansion coefficient of aluminum and resin that is used for the encapsulation of the coil. It permits not to create cracks or micro-cracks in the englobed columns.

The windings are manufactured by using computerized that permit to create a correct traction of the conductor, in order to obtain perfectly homogeneous and symmetrical coils - essential conditions for a long lasting service life of the transformer. The low and medium voltage windings, on customer request, can be made of copper as well.

When the windings are ready, the next step is their incorporation into a cast resin by using a vacuum autoclave oven. This technique confers high level insulation, thermal, climatic and environmental properties. Once the coils ready they should be placed and fixed in the columns of the magnetic core.

At this point the LV and MV connections are carried out and all the accessories required should be fitted.

Dry cast resin transformers are perfect for internal use: they are silent, safe (no risks of toxic dielectric leaks) an have an excellent fire resistance and an immediate self- extinction, as well as a high resistance to industrial pollution.

We are able to offer **Ecodesign** epoxy resin transformers with low losses

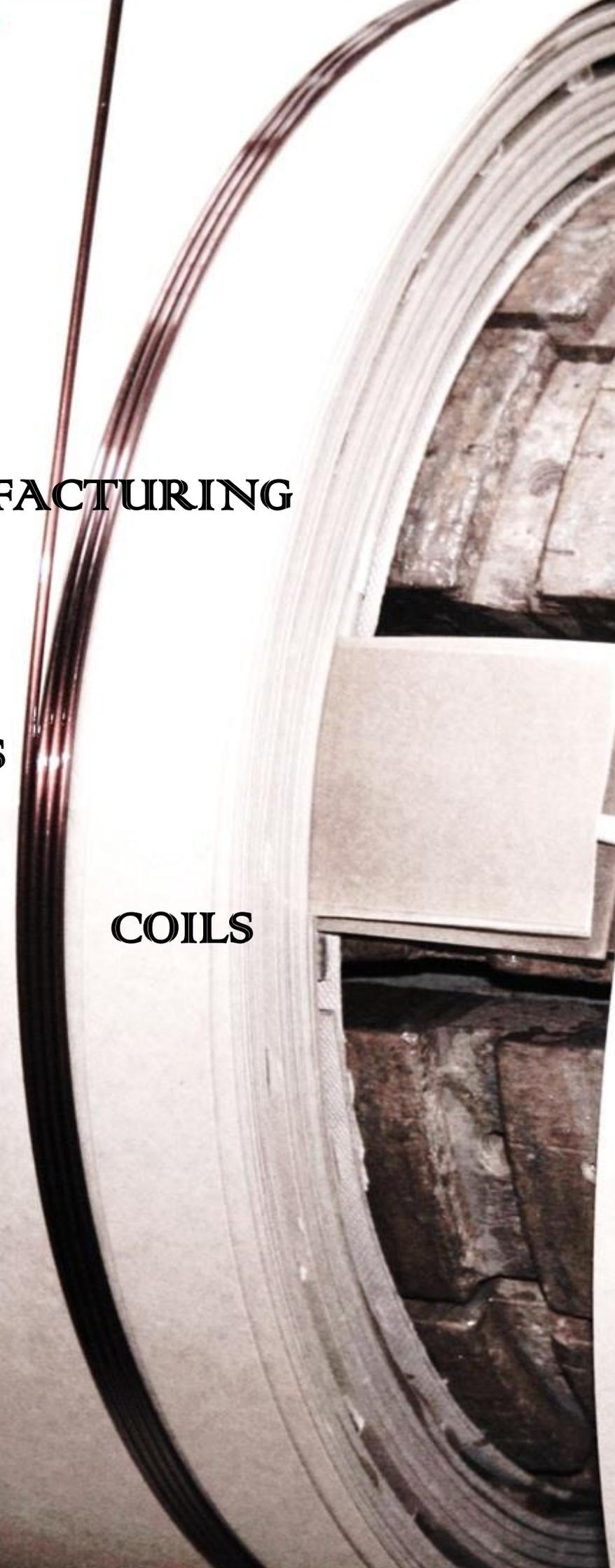
up to 10 MVA power and 36 kV voltage.



**MANUFACTURING**

**OIL IMMERSED  
TRANSFORMERS  
&**

**COILS**



Like in any other transformers production,

one of the most important thing in production of dielectric-immersed transformers is manufacturing of winding.

The LV windings are normally made of aluminum that is known for e a better resistance to the electrodynamic stresses; the turns are insulated by a material composed of pure cellulose paper – transformer board.

To allow a better circulation of oil inside the coil, and therefore a higher dissipation of the heat produced, in certain cases appropriate channels are created by inserting between two coils of a series of transformer board slats.

The LV windings, on customer request, as an alternative can be made of copper.

All insulation materials are heat class A or higher and are constantly subjected to strict controls.

These windings as well can have appropriate channels made, so the insulation liquid provides its function of heat transfer from the windings to the cooling system placed on the tank, thus obtaining an optimal temperature.

The coils thus constructed first are dried in a thermoregulated oven by temperature between 80-90 ° C, in order to extract the moisture from the inside of the insulating papers, and thereafter inserted in the columns of the magnetic core and fixed with wooden slats of beech.

The next step is an assemblage with a magnetic core, designed by SIRMET, by putting steps of variable size, to achieve an almost circular section, thus optimizing the fill coefficient. The sheets used for the construction are of laminated grain-oriented steel with low loss, insulated in carlyte and have joints with a 45° cut lap step.

It provides the low losses and low no-load currents.



**MANUFACTURING  
DRY AIR INSULATED TRANSFORMERS  
&  
COILS**

When there is a dry transformer needed,

the choice is pointed usually on Air insulated transformers when the input and output voltages are relatively low, normally under 1000 V. Our manufacturing line of this type of transformers is available in any rate power between 10 kVA and 10 MVA.

The windings are manufactured with tape, straps and aluminum or copper wires. The insulation between the different layers is made from insulating paper, insulation class F or H, also the straps and the wires are further insulated with tapes or enamels.

For the better air circulation and appropriate cooling of the coil in certain cases there are some channels created by putting fiberglass slats between the turns of the coil. Using machines with computerized system permits to create a perfect symmetric windings which is a crucial for a long service life of the transformer.

Completed coils are assembled with columns of magnetic core. All transformers cores are of our internal design and manufactured by qualified partners. The cores for air insulated transformers with a rated power up to 100 kVA are produced by using grain-oriented steel and 90° cut, meanwhile for over 100 kVA machines is used only 45° cutting, that permit to optimize the size and by reducing losses, increase efficiency.



Any of our transformers could be customized as for client's needs and requirements.

Transformers could have a standard losses as per local Law, but we suggest products under European Commission Regulation 548/2014, called also **Ecodesign** – mandatory in whole EU.

