

Coiltech 2011 Nord Alpe Adria – 28/29 September 2011

SESSION 3

The power distribution transformers: starting from the raw materials through the process we check where we can arrive with the efficiency

CENTRO SVLUPPO MATERIALI s. p. a.

Stefano Cicalè

Grain Oriented Electrical steel: production technology development, material characteristics improvement and opportunity for electric machines manufacturers.

Abstract:

Grain Oriented Electrical Steel is used since 40's to manufacture the magnetic core of electric transformers. In particular it is the almost exclusive material for large power transformers.

It is characterized by a pronounced magnetic anisotropy (magnetic characteristics strongly dependent on cutting angle respect rolling direction), consequence of a pronounced crystallographic anisotropy (crystals orientation near Goss Orientation).

The conventional production technologies are based on a very long and complex production cycle, which includes a slab re-heating, before the hot rolling at very high temperature (1400°C), requiring special re-heating technologies, particularly expensive and characterized by high energy consumption.

In the last years the material producers have been performing consistent R&D work, which has allowed from one side to simplify the production technologies and on the other side to improve the material characteristics. Innovative, compact, casting technologies have been introduced (thin slab casting and strip casting) in the production cycle; innovative products have been introduced with thickness both higher and lower than the ones available on the market (at present in the range 0.23 mm-0.35 mm) and high permeability (B800>1900 mT).

The contribution, beside summarizing the improvements done, outlines the possible developments, putting in evidence the advantages for the electric machines manufacturers in using improved characteristics materials.

CurriculaDr Stefano Cicalè

- Graduated in Physics at University of Rome "La Sapienza" in 1992.
- Since 1992 has been working at Centro Sviluppo Materiali, where he has been mainly dealing with *Electrical Steels* metallurgy, working on process/product/application R&D projects, commissioned by main Electrical steel producers worldwide (Terni, ThyssenKrupp, Arcelor Mittal,...). In this framework is author of scientific papers and patents.
- At present is "Project Leader" at Centro Sviluppo Materiali for projects related to *Electrical Steels* development.



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L.A.E. Lughese Attrezzature per l'Elettromeccanica s.r.l.

Alex Bertuzzi

Transformer efficiency through the production chain

Abstract

Talking about efficiency on transformers, an important reduction of losses to take into consideration are the so called "No Load Losses" also noted as Iron Losses as depending from the transformer core made of magnetic steel.

These losses are in fact running on the transformer 24 hour a day all year around from the moment the Transformer is installed and energized.

Through high quality of materials, new process and careful handling, it is certainly possible to reduce No load Losses thus increasing transformer efficiency.

LAE commitment is to improve efficiency on transformers within all production process within its scope of machine production starting from winding, through the core and ending to the enclosure tank.

LAE gives then recently even a greater attention and makes good efforts for the sustainability of our environment confident on the fact that this could be achieved through Home and Industry possible power savings from one hand and the use of Alternative energies on the other side. In this view LAE interest is to design machine with Power savings solution, to produce always better efficient transformers, using also Energy from the Sun.

Curricula Alex Bertuzzi

Nato a Lugo il 15 Luglio 1970. Appena finiti gli studi tecnici per l'Elettromeccanica, decide di unirsi all'attività fondata dal padre e così incomincia la sua carriera lavorativa in LAE seguendo inizialmente la progettazione Elettrica ed Elettronica, a seguito di corsi a Londra della lingua Inglese inizia la sua carriera Commerciale di affiancamento prima e Direzione poi, spostando l'azienda sui mercati Internazionali e seguendo la crescita professionale anche con alcuni corsi (tra i quali MKTG presso la Bocconi MI). Dal Dicembre 2011, anche a seguito di mutamenti societari diviene Direttore Generale dell'azienda continuando a prediligere comunque l'area commerciale quale area di visione a lungo termine per ogni azienda, fonda il sito di web marketing nel settore Trasformatori www.Trafoworld.com e si adopera per iniziare sinergie tra imprese correlate dopo alcune esperienze maturate con progetti di nuove fabbriche per trasformatori in Russia e Medio Oriente.

A.m.e. Srl

Andrea Orrea

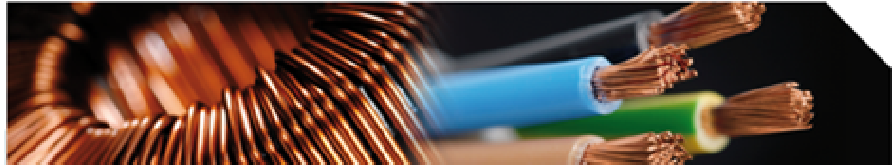
Accuracy in the No-load losses measurement on transformers

Abstract

Talking about the solutions to perform correctly the No-load losses on the transformers.

The importance of the measuring system (Instruments transformers and wattmeter) and of the power source.

The problem of the high harmonic distortion of the no-load current during the feeding of the transformers can produce a distortion also on the feeding voltage determining a wrong Voltage Form Factor and so an important error in the measurement of the No-load losses.



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Curricula di Orrea Andrea

Nato a Modena il 30 Agosto 1971. Dopo gli studi, decide di entrare nell'azienda fondata dal padre, come impiegato per innovazione tecnologica delle apparecchiature. Oggi ricopre la mansione di Direttore Tecnico e Responsabile Vendite. L'opera del Sig. Orrea ha portato l'azienda A.M.E. ad affermarsi a livello internazionale come produttrice di sala prove per trasformatori "chiavi in mano". Si annoverano collaborazioni con centri di ricerca e laboratori quali CESI, RSE, CERN, ENEA ed INRIM.